VIEW

OF THE

AGRICULTURE

OF

MIDDLESEX;

WITH

OBSERVATIONS ON THE MEANS OF ITS IMPROVEMENT,

AND

SEVERAL ESSAYS ON AGRICULTURE IN GENERAL.

DRAWN UP FOR THE CONSIDERATION OF

THE BOARD OF AGRICULTURE,

AND INTERNAL IMPROVEMENT.

BY JOHN MIDDLETON, ESQ.

OF WEST BARNS FARM, MERTON, AND OF LAMBETH, SURREY,

LAND SURVEYOR;

Member of the London Society for the Encouragement of Arts, Manufactures, and Commerce, and Corresponding Member of the Board of Agriculture.

ACCOMPANIED WITH

REMARKS OF SEVERAL RESPECTABLE GENTLEMEN AND FARMERS.

SECOND EDITION.

LONDON:

PRINTED BY B. M'MILLAN, BOW-STREET, COVENT-GARDEN,

PRINTER TO HIS ROYAL HIGHNESS THE PRINCE OF WALES;

FOR G. AND W. NICOL, PALL-MALL, BOOKSELLERS TO HIS MAJESTY, AND THE BOARD OF AGRICULTURE; AND SOLD BY ROBINSON AND WILKIE, PATERNOSTER-ROW; CADELL AND DAVIES, STRAND; J. ASPERNE, CORNHILL; W. CREECH, EDINBURGH; AND JOHN ARCHER, DUBLIN.

1807.

[*Price Twelve Shillings.*]

ADVERTISEMENT.

THE great desire that has been very generally expressed, for having the AGRICULTURAL SURVEYS of the KINGDOM reprinted, with the additional Communications which have been received since the ORIGINAL REPORTS were circulated, has induced the BOARD OF AGRICULTURE to come to a resolution of reprinting such as may appear on the whole fit for publication. It is proper at the same time to add, that the Board does not consider itself responsible for any fact or observation contained in the Reports thus reprinted, as it is impossible to consider them yet in a perfect state; and that it will thankfully acknowledge any additional information which may still be communicated: an invitation, of which, it is hoped, many will avail themselves, as there is no circumstance from which any one can derive more real satisfaction, than that of contributing, by every possible means, to promote the improvement of his Country.

N. B. *Letters to the Board, may be addressed to Sir* JOHN SINCLAIR, *Bart. the President, No. 32, Sackville-Street, Piccadilly, London.*

INTRODUCTION

TO THE FIRST EDITION.

IT cannot fail to excite a considerable degree of astonishment, that the noble and useful science of Agriculture, to which we owe not only many of the comforts and conveniences of life, but even the means of existence, should so long have remained neglected, and almost despised; while every other art, from the liberal encouragement and support they have received, seem to have gone on in a steady step towards perfection. But the period of indifference and neglect is passed, and the time seems at length to have arrived, in which we shall no longer have occasion to lament the slow progress that has hitherto been made in this invaluable branch of science. Happily for the country in general, and for the agricultural part of the community in particular, such a spirit for the improvement and advancement of husbandry has gone forth into the world, and diffused itself among all ranks of society, as will, undoubtedly, under the auspices and assistance of the Honourable Board of Agriculture, and by the interesting communications of its many intelligent correspondents, effect the

most beneficial improvements in the Agriculture of the kingdom. The many barren and uncultivated wastes, which have so long remained a mark of disgrace to the spirit and character of Britain, will probably be cultivated, and thereby changed into a permanent resource of wealth and prosperity to the nation, and an extraordinary degree of emulation and competition among the more enlightened class of husbandmen will be excited, whose example will no doubt speedily be followed by every farmer of common sense.

When we reflect on the extraordinary, and almost inconceivable exertions that have lately been made, even by *individuals*, towards the general improvement of Agriculture, but more particularly in the important article of live stock, in some of the midland counties; what advantages may we not promise to ourselves from the *united* efforts of nearly all the agricultural abilities of the kingdom, employed in collecting, and afterwards in digesting into a regular system, all the information that can possibly be procured from every corner of the island, of the most improved management of every sort of soil and cattle; of the best implements now in use for every branch of husbandry; and, in short, of every thing that can at all be either interesting or useful on this important subject. It is indeed impossible to appreciate the benefits of such a measure; they

are,

are, whether considered in a national or individual point of view, really incalculable!

It will readily be admitted, on a moment's reflection, that the more highly any country is cultivated, and the nearer it approaches to perfection in its rural concerns, the greater will be its increase of population, and of course, its strength and consequence in the scale of nations. This consideration points out to the *Government* of this country, the sound policy, and true wisdom, of giving all possible encouragement and assistance to a spirit of industry and exertion, among the best part of its population, the healthy sons of agriculture.

For the same reason it follows, that the individual who makes even the smallest effort towards the furtherance of this great national object, renders essential service to his country, and may therefore justly lay claim to the candid attention of his fellow-citizens, though he may perhaps (as in the present instance) be but a weak advocate in a noble cause. Under this impression it was, that I undertook the task of writing the following Report on the Agriculture of the County of Middlesex, fully sensible of the many disadvantages I laboured under, as well from professional engagements, as from my inability to do justice to the subject. The work, such as it is, I commit to that candour and indulgence with which the public always receives every well-

meant endeavour to advance national improvement. Should I be so happy as to have it thought that I had, in the smallest degree, attained the object I had in view; that I had furnished any useful information to the agricultural world, or that I had, in the least, contributed to promote the laudable designs of the Honourable Board of Agriculture, I shall consider myself as most amply repaid for the care and attention I have bestowed on the subject.

J. M.

Lambeth, 1797.

INTRODUCTORY ADDRESS

TO THE SECOND EDITION.

THE first impression of this Work was spoken of in the Commons' House of Parliament on Monday, December the third, 1798, by that illustrious Statesman, the late Right Hon. WILLIAM PITT, in terms which were exceedingly creditable to me. It was also taken notice of in the debates of the House of Peers. The most respectable of the Reviewers have written of it in terms of panegyric. The Compilers of the English Encyclopædias have extracted largely from it. The Writers on Agriculture have done me the honour of copying whole pages; the more respectable of them have acknowledged it, and the others are not worth notice. The Editors of various Periodical Publications have also drawn largely from the same source: but they are not expected to name the hives from which they obtain their sweets.

Such parts of the former Edition as seemed to be of little consequence, I have thought it advisable to suppress; and the progress which knowledge has made in pursuits of this kind, rendered it necessary to omit several others.

These

These causes have diminished the quantity of the original Work considerably; but the new, and, I hope, more important matter, the removal of some confusion, and the new arrangement which some of the Sections have undergone, will supply the place of all that has been left out.

J. M.

Lambeth, 1806.

ERRATA.

Page 182, line 16, *for* this, *read* the.
—— 208, — 8, after the word "but," add "from that time."
—— 366, — 13, *for* enclosures, *read* enclosure.
—— 416, — 8, *after* cows, *add* the mark of quotation.
—— 448, — 7 from the bottom, *for* acquired, *read* required.
—— 524, — 17, *for* Hanworth, *read* Hammersmith.
—— 572, — 2, *for* 15,300,000 acres, *read* 15,000,000.
—— 572, — 3, *for* 64,269,000*l.* *read* 63,000,000*l.*
—— 572, — 19, *read* 15,000,000 acres and 63,000,000*l.*
—— 572, — 25, carry forward 64,000,000*l.*
—— 573, — 1, brought forward 64,000,000*l.*
—— 573, — 20, after the total, *for* 131,360,000*l.* *read* 130,100,000*l.*

CONTENTS.

PAGE

CHAP. V. IMPLEMENTS, ... 99

Observations on Implements, ... 101

CHAP. VI. COMMONS, ENCLOSING, &c.

SECT. 1. Commons, ... 112
Enclosing, ... 121
2. Common-Fields, ... 132
3. Enfield Parish and Chase, ... 134
4. Stanwell Enclosure, ... 143
5. Sheep Downs, ... 144
6. Fences, ... 150

CHAP. VII. ARABLE LAND.

SECT. 1. Tillage, ... 158
2. Fallowing, ... 183
3. Rotation of Crops, ... 185
4. Crops commonly cultivated, ... 200
1. Wheat, ... 202
2. Rye, ... 232
3. Barley, ... 232
4. Oats, ... 239
5. Beans, ... 241
6. Pease, ... 247
7. Potatoes, ... 250
8. Tares, ... 252
9. Turnips, ... 258
5. Crops not commonly cultivated:
1. Rape, or Cole, ... 270
2. Boot-cole, ... 272
3. Turnip-rooted Cabbage, ... 272
4. The Swedish Turnip, ... 273
5. Lucerne, ... 274
6. Chicory, ... 274
7. Liquorice, ... 274
8. Hops, ... 274
9. Colours for Dyeing, ... 275

CHAP.

CHAP. VIII. GRASS.

PAGE

SECT. 1. Meadows and Pastures, ... 279
2. Sown Grasses, ... 293
1. Red Clover, ... 293
2. Sainfoin, ... 301
3. Restoring Arable Land to Grass, ... 302
3. Hay-making, ... 309
4. Feeding, ... 321

CHAP. IX. GARDENS AND ORCHARDS.

SECT. 1. Fruit-Gardens, ... 323
2. Kitchen-Gardens, ... 328
3. Nursery-Grounds, ... 338

CHAP. X. COPSES, WOODS, PLANTATIONS, 342

Hedge-row Timber, ... 344
Willows and Oziers, ... 348

CHAP. XI. WASTES, ... 352

CHAP. XII. IMPROVEMENTS, ... 352
SECT. 1. Draining, ... 355
2. Paring and Burning, ... 365
3. Manuring, ... 374
4. Weeding, ... 397
5. Watering, ... 398

CHAP. XIII. LIVE STOCK, ... 406
SECT. 1. Cattle, ... 409
Neat Cattle, ... 409
Cows, ... 414
Feeding Cattle, ... 424
——— Calves, ... 426
Butter, ... 427
Animals not Natives of Great Britain, .. 431

SECT.

PAGE

No. 3. On Enfield-Chase, and the Superiority of Paring and Burning over every method of tilling it, by Dr. Wilkinson, 665

4. On Newbury Peat-Ashes, by Richard Crockford, 666

5. On Soot, Malt-Dust, &c. by James Lucas, .. 667

6. Mode of fattening of Cattle with Molasses, by L. Millington, Esq. 668

7. An Account of a Dutch Dairy, by the Rev. J. Tickell, 669

8. The Method of making Butter in Holland, by Mr. R. P. Carew, 675

9. On the beneficial effects of Steaming Grain, by J. L. Banger, Esq. of Madeira, 675

10. Observations on the Yellow Colour of the Fat of Mutton and Beef, 680

11. On the Shipping of Corn, ... 681

12. Price of Bread for Seventy Years, ... 683

INDEX, ... 685

AGRICUL-

AGRICULTURAL SURVEY

OF

MIDDLESEX.

CHAP. I.

GEOGRAPHICAL STATE AND CIRCUMSTANCES.

SECT. I.—SITUATION AND EXTENT.

MIDDLESEX is an inland county, situated towards the south-east part of the island. It is bounded on the south by Surrey, from which county it is divided by an imaginary line drawn down the middle of the river Thames; on the east by Essex, from which county it is divided by a similar line drawn along the middle of the river Lea; on the west by Buckinghamshire, from which county it is divided by a supposed line drawn down the middle of the river Coln; and on the north by Hertfordshire, from which county it is divided by an irregular line of parish boundaries.

This county is of a very irregular shape; but if its figure was reduced to a regular parallelogram, of equal superficies, the medium length and width would be about twenty miles by fourteen; and consequently, it contains

280 square miles, or 179,200 acres: every part of which, that is not occupied by buildings, roads, water, &c. is susceptible of cultivation.

It received its name from having 'been inhabited by a party of Saxons, who, being situated in the midst of the three petty kingdoms of the East, West, and South Saxons, called themselves, or were called by their neighbours and brethren, Middle Saxons, which, in common conversation, was soon abbreviated into Middlesax, or Middlesex.'—*(Magna Britannia.)*

It possesses some very superior advantages over every other county, in its comprising the Capital of the British Empire, the seat of Government and of Legislation, of the Law, of Learning, and the Fine Arts; where all the families of the first rank and wealth occasionally reside, which is generally during the sitting of Parliament, and where the business of the richest merchants, bankers, and citizens, is carried on, to an extent that is unequalled in any other part of the globe*.

SECT. II.—DIVISIONS.

THIS county is primarily divided into Edmonton hundred, Elthorne hundred, Finsbury division, Gore hundred, Holborn division, Isleworth hundred, Kensington

* London (says Mr. COLQUHOUN, in his admirable Treatise on Police) is not only 'the first commercial city that is known at present to exist, but is also one of the greatest and most extensive manufacturing towns, perhaps in the universe: combining in one spot every attribute that can occasion an assemblage of moving property, unparalleled in point of extent, magnitude, and value, in the whole world.'

hundred,

hundred, Spelthorn hundred, Tower division, the City of London within the walls, ditto without the walls, and the City and Liberties of Westminster. These are subdivided into 230 parishes, precincts, and extra-parochial places, whereof 122 are within the City of London, 10 in the City and Liberties of Westminster, and 98 are in the rest of the county; all which are further particularized under the Section on Population.

The City of London is governed by a Lord Mayor, two Sheriffs, 26 Aldermen, 236 Common Council-men, and a Recorder.

A freehold estate in this city does not entitle its owner to a vote at the county, or any other, election for members of Parliament.

The City of Westminster is governed by a High Steward, Deputy Steward, High Bailiff, Burgesses, &c. The Dean and Chapter of St. Peter's Cathedral choose the High Steward, who is commonly one of the nobility, and holds that office for life; he chooses his Deputy (who is always some eminent lawyer), and the High Bailiff; the Burgesses are chosen by the several wards.

This city hath properly but one parish, called St. Margaret's; but there are nine others, which are called the Liberties of Westminster, from their enjoying the freedom of that city, and also St. Martin's-le-grand, which, though circumscribed by the City of London, is part of the Liberty of Westminster.

The Cities of London and Westminster, and about 50 adjacent parishes in Middlesex and Surrey, form one town, the Capitol of Great Britain, known by the general name of London.

LONDON.

It may be expected, that in the Report of Middlesex, some account should be given of the state of the Capital. To enter much at length into so vast a subject, is beyond the bounds allotted for a work of this nature. It may therefore be sufficient to lay before the reader the following extract from a paper written by that respectable physician, the late Dr. GEORGE FORDYCE, which describes the climate, and other circumstances connected with the general state of London, with great force and brevity.

'London is situated in latitude 51° 31′ north, longitude 5′ 37″ west from Greenwich, 5° 16′ 23″ east of the opening into the Mediterranean from the ocean. The town is large, for an European town, being in a body about five miles in length, and three in breadth, besides a number of rows of houses lining each side of the roads going out from it. A mile is $1691\frac{6485}{10000}$ lengths of a pendulum swinging seconds. The greatest part of the town is situated on the north side of a river called the Thames. The ground on which this part stands, is an hill, which rises with a quick ascent from the bank of the river, and then gradually, although unequally, to the north-west, which is the most elevated part. The river on the south side is confined by an artificial bank, the ground on that side being flat; but the water does not stagnate in such of the ditches as are suffered to have the tide flow through them; wherever that is admitted, it scours them clean, and carries off much filth; but there are many ditches from which the tide is shut out, and they are always loaded with putrid matter.—On this side stands a considerable part of the town, called Southwark, which, including the parish of Christ Church, and part of Lambeth and Newington, is a body of near

three

three miles by one. On the north side of the river, 'London reaches along the river side to the west, until the river leaves the bottom of the hill, and turns to the south.' Above this, the river is confined between artificial banks on both sides, and is lined with houses till it runs through two old towns, Westminster and Lambeth.

'London is surrounded, besides the houses which line the roads, with many large villages.

'The river Thames runs through a valley, upon a bed of the gravel of flints, and probably clay under it, for many miles above and below London. The valley is bounded on both sides by hills not exceeding 400 feet in height. Where the river runs in the middle of the valley, it is secured by artificial banks on both sides, which have lasted longer than the memory of history, extending in all more than thirty miles. These banks, when the river washes the bottom of the hills on either side, are only continued on the opposite side. When not increased by either rains or the tide, the river is about a quarter of a mile broad, not more than twelve feet deep, and now and then, in very dry seasons, it has been forded by horses. The tide in this river flows above fifteen miles higher than London. At London it rises, at spring tides, from twelve to fourteen feet. The water is very pure some miles above the town; near the town it is mixed with mud, and contains a sufficient quantity of mucilaginous matter to putrefy. When preserved in casks, it purifies itself by putrefaction, and remains afterwards more pure, but it never purifies sensibly in the river, nor in the cisterns in which it is sometimes kept for a few days for use. At the lower part of the town it contains a little sea salt, when the tide is at its height; but this does not reach to the middle of the town. Its specific gravity is nearly the

same with that of distilled water. The inhabitants are supplied with this water, which is pumped up by several engines, principally worked by fire, into their houses.

'The town is also supplied with water by an aqueduct, which is brought from' near twenty 'miles distance, from the north, through a canal of about 36 miles in length. The water of this aqueduct is also pure, and, unless when heavy rains bring down' mud, it is bright and clear, and does not putrefy on keeping. Its specific gravity is also nearly the same with distilled water. This water, as well as the other, is carried in wooden pipes under the streets into the houses of the inhabitants.

'There are springs found on digging, every where in the town, which might yield large quantities of water: these were formerly used, but are now little employed, because the supply from the Thames and New River is much cheaper. The waters of these springs contain a small portion of sea salt, and a larger quantity of magnesia vitriolata, so as to be sensible to the taste, and so as, in some places, to act as a purgative. They also contain gas; sometimes in quantity sufficient to give them briskness, and render them agreeable to the taste.'

Rain-water is little used, except by the laundress and the house-maid, owing to its being always very impure, from the dust which it washes from the tops of the houses.

'The whole supply of water, from aqueducts and engines, is 109,440 cubic feet in an hour.

'The valley through which the Thames runs, is gravelly, generally dry, and not marshy till about a mile below the town, the water in the river being confined between its banks.

'The hills or risings on which the principal part of the town

town stands, are mostly a mixture of clay and sand, the sand or gravel generally being in rather the largest proportion. In some places the soil is gravel.

'The winds from the south-west to north-west, and from south-east to north-east, are the most prevalent*. The westerly winds blow over the great Atlantic Ocean, passing, before they reach London, over part of Great Britain for about two hundred miles, and over Ireland when they veer to the north. They are generally moist, although much drier than when they arrive at the west

* This passage would correspond more with my own observations, if it stood thus: the winds from south-west to west, and from east to north-east, are the most usual; I think they prevail ten months in every year.

Winds blowing from every point of the compass between the west, north-west, and north, are so very dry, as not to produce a day's rain in a year, though I have observed, as an uncommon circumstance, small rain for two or three hours from the north-west. An east wind is always dry; generally with black clouds, and the same from the other points, till the wind gets about to, or near, the north-east, which, with a few points on either side of the north-east, most frequently brings the like dry black cloudy, but sometimes gentle rain, for a day or two.

When the wind veers from the north through the west, it continues dry till it passes the south-west, from which point to the south, it almost certainly brings rain; but it seldom stops there a day, but it returns to the same point; and when it passes southward through the eastern points, all is perfectly dry till it reaches about the south-east. The atmosphere then begins to give the appearance of rain. The wind, however, seldom rests there, but veers to the south, and from that quarter and a few points more westerly, we receive the greater rains.

During the spring months, the wind frequently blows warm and steadily from the south-west for near a fortnight; in a few hours it changes to the opposite point, or the north-east, and blows a steady cold gale for about another fortnight. This is repeated very often in the course of the year. The former winds induce people to leave off their winter clothing; the latter strike them by surprize, thus thinly clothed, and is the cause that many diseases at that time prevail.—*J. M.*

coast of the island. They are commonly most prevalent in February, September, November, and December. The easterly winds blow over the large continent of Europe: they are always dry. They are most prevalent in January, March, and the beginning of April. They are cold, except sometimes when they blow in July and August; while the westerly winds are almost always warm, except in November, if they verge to the north.

'The heat of the air is very variable, seldom remaining equal for many days; and every year differing entirely from the preceding ones, not only in heat, but also in moisture and rains. Sometimes the winter is severely cold, with frost from November till May, with little interruption. Sometimes the water is not frozen for more than ten or twelve days. Most commonly, there is a little frost in November and December, but otherwise these months are usually very foggy and moist. The principal frost generally is in January; February is commonly a mild open moist month. March is generally cold and dry. The summer months vary as much; sometimes there are three months very warm; sometimes not more than a week: the latter half of July is commonly the hottest. In August heavy rains often fall, especially in the last half of the month. The thermometer sometimes rises to above 80° of FAHRENHEIT's scale, very rarely to 84°, but the most common summer heat is from 65° to 75°; it sometimes falls in the winter to 15°; it has been known to fall below the point marked O, but very rarely. The most common winter heat when it freezes, is between 20° and 30°; the most frequent when it does not freeze, between 40° and 50°.

'The air when dry is always loaded with, and often obscured by, dust, which consists of ashes and soot arising from

from pit coal, the fuel which is commonly burnt; horse-dung produced and ground to small powder, by the numerous carriages drawn by horses, with which the streets are always crowded; powder of granite and flints, which form the streets and roads, and are ground extremely fine by the wheels of the carriages.—These powders, with various others, penetrate the houses every where, and undoubtedly enter the trachea, adhere to the surface of the lungs, and not uncommonly produce cough, with difficulty of breathing.

'The streets are generally wide, few of them so narrow as to prevent two carriages from passing, and many of them wide enough to allow five or more to pass; especially in new parts of the town, which form more than half of it, they are from sixty to twenty feet wide; those of great communication seldom less than thirty in the old part of the town; in the new part, most of them are not less than forty.—In several places there are squares of a considerable size, *i. e.* from about 100 to 1000 feet square: The streets are well paved and clean, notwithstanding the immense quantity of horse-dung constantly falling upon them.

'The houses, except most of those in the oldest part of the town, which are not more than a quarter of the whole, have a story sunk under the level of the street. This contains the kitchen and other offices. Below the level of the bottom of this story a covered canal is dug under the street, with which there is a communication from the houses, and by which putrescent matters sufficiently fluid are carried off. Ashes, bones, &c. are conveyed away in carts twice a week. The greatest part of the houses are of a uniform structure; in each story a large room in front; a smaller room and the staircase occupy the back part; and there is frequently a smaller room

room added behind. There are commonly four stories, besides the one under the level of the street.'

The town is so fully inhabited, that the risk of a house being unoccupied, does not exceed one in fifty.

The number of inhabitants is known to be upwards of eight hundred thousand. They consist of classes living in very different manners.

'The first class includes those living on their paternal fortune, or riches suddenly acquired, comprehending a few merchants. The women of this class live almost constantly in their houses, which are very close, although the rooms are spacious, and the whole house perfectly clean and neat; or in carriages, with no labour and little exercise. This gives them a delicacy in their appearance, hardly to be described. As a flower brought forward by the cherishing heat of a conservatory, where it is defended from the nipping winds, exceeds any thing produced by nature alone, like it, they too have a tenderness of constitution which subjects them to disease from the slightest exposure to any cause.

'Their situation, however, prevents them from being often exposed to infection or sudden cold, which are the great causes of violent diseases in this metropolis. Their complaints therefore are generally slight, and very irregular; nor can they bear medicines in any way of a rough nature: their disorders must therefore be touched with the slightest hand. This has often produced an imbecility of practice, not only in London, but throughout the kingdom, which first infects the medical people who are immediately employed in the disorders of this class.—Although there may sometimes perhaps be found one or two among these who are not the most learned or judicious practitioners, yet they are the richest, which contributes not a little to the spreading of this infection. Notwithstanding the

diseases

diseases of the women of this class are frequent, yet they are seldom fatal, so that they often live to a great age.

'The men of the first class are much in the air in the morning, and use exercise. They live in the country part of the year, when they are often occupied in hunting and shooting. With some exceptions, they are of constitutions sufficiently strong; are seldom diseased; their diseases are strong and marked, and they bear the operation of powerful remedies.

'The men who are menial servants of this class, like the domestic slaves of the ancients, are idle, lazy; use little exercise; none when they can avoid it: they are thus rendered irritable; and being often exposed to all the inclemency of the weather in the winter season, often till three or four o'clock in the morning, they are exceedingly subject to disease, particularly of the thorax; and few of them attain to any great age, except those of the higher ranks.

'The women-servants resemble, in their constitutions, their mistresses.

'The clergy are fewer here than in almost any other country in Europe. They are very apt to be affected with hypochondriacal complaints; but being in general regular in their manner of living, they often attain to a great age.

'The lawyers who are occupied in business, are often, from their great attention and labour of mind, weak and disordered in their *primæ viæ*. Those who are not employed, may be considered as in the same state with the independent gentlemen.

'Physicians are so few, that it is hardly worth enumerating them. There are not much above two hundred in all, and not near half that number are employed in practice. Except when they are cut off by infectious fevers, before

before they are habituated to infection, although often diseased, physicians generally attain a considerable age.

'Attornies and apothecaries are to be considered, in their manner of life, and constitutions, in the order of tradesmen.

'Merchants and traders of consequence form the next class. The women of this class live a regular life, going to bed generally before midnight, and rising about nine in the morning. Most families have villas near town, where the women pass much of their time, especially during the summer season. They are much more in the air, and consequently have neither the delicacy nor the irritability of the class we have first enumerated; enjoy a much better state of health; their diseases are more regular, and they bear the action of powerful remedies. Of the men of this class, some lead a sedentary life; their time is much employed in writing; generally leaning on their breasts: such are subject to complaints in their *primæ viæ*; others of them use exercise, especially on horseback, and often sleep in the country: all of them, in point of eating, are luxurious.

'The lesser tradesmen, shopkeepers, and manufacturers, are also sober and regular in their manner of life; but they are much confined to their houses, especially the women of this class, which renders them irritable, and subject to disease, often violent and fatal. Nor is that part of the men whose business calls them abroad, less subject to morbid affection, so that they rarely attain to great old age.

'The last class consists of the working part of the manufacturers, and labourers of all denominations: working hard, and being dextrous in their occupations, and of course earning large sums of money, which they spend in drinking, exposing themselves at the same time to the inclemency

clemency of the weather; always idle while they have any money left, so that their life is spent between labour and attention above their powers, and perfect idleness and drunkenness. Their women also, passing from affluence to distress almost every week, are forced, although soberly inclined, to lead a very disorderly life. Pulmonary complaints are more particularly common and fatal in this class, as well as all other diseases.

'London is fatal to infants in general. On a comparison of charity children sent to be nursed in the environs, with those nursed in town, it appeared the loss in town, being 39, was only 29 in the same number and time in the country. But if this loss is great altogether, it is tremendous among the lowest class; the mothers being almost always obliged to labour for their bread, and often even robbed by their husbands, have no time left to take the care necessary for the rearing of infants, so that they are often left to wallow in dirt, notwithstanding the general disposition to cleanliness in this country, and can never receive that exercise, or purity of the air, which is requisite; nor can their food be at all attended to.—Add to this, a pernicious practice of continuing to give them suck for even two or three years, by which they hope to prevent their having charge of many children. This pernicious practice goes even to some mothers of the ranks above this: while mothers in the higher ranks refuse the natural sustenance to their infants, leaving them often to the care of strangers regardless of motherly affection. From all these causes, the loss of children in London is more than one half, before they attain the fifth year of their age.'

SECT. III.—CLIMATE.

The temperature of the atmosphere, except perhaps so far as the influence of the London fires extend, is nearly the same through the whole county, there being no situation so much elevated as to produce the cold and thin air that we find in mountainous countries.

In general, it is healthy, owing to the greater part of the soil being *naturally* dry; and the more moist situations being well drained, are consequently free from those unhealthy vapours which usually arise from stagnant waters.

The fires of London, in which are consumed upwards of 800,000 chaldron of coals annually, have a sensible effect on the climate in its neighbourhood, by drying and warming the atmospherical air; which, being thus rarefied by heat, constantly passes upwards, and makes way for a fresh supply to come in from every side.

The more stationary winds are from the south-west and the north-east: all others are variable and unsettled. Those from the south-west are supposed to blow nearly 6-12ths of the year, and those from the north-east about 5-12ths. The varying winds blow from all the other points of the compass about the other 1-12th. The winds seldom blow with so much force in this district, as to shake the grain out of the ripe ears of the standing corn.

The greatest falls of rain come from a few points west of the south, and are of the longest continuance when the wind has passed through the east to the south.

In the spring months, the damp on low ground is sometimes congealed by cold, when there is no such appearance on the hills, and thereby some of the young shoots of the more tender shrubs and plants are destroyed in the former situation, when no injury happens to those in the latter;

latter; though this phenomenon probably happens less frequently in Middlesex than in such counties as abound more with hill and dale.

So great has been the extremes of heat and cold, at some particular times, that on the 16th July 1793, the thermometer rose as high as 83°½ *, and on the 24th January 1795, it fell down to 6 degrees below O; though this, perhaps, is the greatest difference in respect of climate ever observed in this county; happily, however, it never continues more than a day or two at such extremes.

The salubrity of any district is affected in a considerable degree by the state of the soil, and shape of the surface of such district; and hence it follows, that the natural climate of most countries may be improved, by using such means as are calculated to procure an equable degree of shelter, dryness and moisture; all which may be effected in bleak, dry, and comparatively barren situations, by dividing them into small enclosures with broad hedge-rows and plantations, in belts of several yards wide; and in low flat situations, by draining off the stagnant water, by enlarging the enclosures, thinning and clipping the hedge-rows; in some instances, by grubbing up not only these hedge-rows, but also copses, woods, and plantations, thus removing every obstruction to a free circulation of air. This will absorb and carry off the redundant moisture, and consequently render the climate salubrious and comfortable.

Indeed too much attention cannot possibly be paid, in cases of making enclosures and plantations, to the important

* The thermometer rose to 83°¼ on the 21st July 1797, at which height it continued for two or three hours, and on the 24th it was at 84° for near half an hour.—*J. M.*

articles

articles of drainage and shelter, and also to the nature and situation of the soil; as by a proper regard to these objects, not only the healthiness of the climate, with respect to animals, will be promoted, but the fruitfulness of the soil will be increased in a degree not otherwise to be expected.

For additional observations on climate, see pages 7, 8, and 9.

SECT. IV.—SOIL AND SURFACE.

SOIL.

THE following observations are offered in a very general way. To delineate the variety of soils, so as accurately to draw the lines between them, would require much more time to investigate every part of the county, than can be expected in a work of this kind.

A surface of perfect sand, clean gravel, or pure clay, is not now to be found in any part of the county. The top soil has every where been ameliorated, by the operation of the elements, by manure, and cultivation; these powerful agents have made the surface of all the lands in this county assume, more or less, the appearance of loam *.

Sand

* The following account of the soil and fertility of Middlesex, extracted from NORDEN's *Speculum Britanic* (written in the reign of Queen ELIZABETH), may amuse the reader, who wishes to compare ancient with modern times.

'The soil of Middlesex is excellent fat and fertile, and full of profite: it yeeldeth corne and graine, not onlie in abundance, but most excellent good wheate, especially about Heston, which place may be called *Granarium tritici regalis*, for the singularitie of the corne. The vaine of this especiall corn seemeth to extend from Heston to Harrow on the Hill, between

Sand and *Gravel.*—Hampstead-hill consists of eight or ten feet of yellow iron-stained sand, with some loam and rounded flints, on a pure white sand of many more feet. The surface is covered with furze, except where the ground is dug.

The summits of most of the highest hills in the county consist of *sand* and *gravel*, though frequently intermixed with loam. I observed in some old enclosures, and on Enfield-chase, in various places, that when the gravel is near the top, a full crop of yellow blossomed broom covers the ground, if in a state of grass; and when ploughed, an equally full crop of sorrel. The acidity of the soil, which produces these plants, might be corrected by dressing the land with lime, chalk, shells, or marl.

Loamy Sand. *—Or dry turnip and barley land, will include all that portion of the county lying between the road leading from Hounslow to Colnbrook, on the north, and the river Thames on the south, containing in depth from one foot to three (though for the most part from eighteen inches to two feet), on the gravel of small flints, six, eight, or ten feet in thickness, and under the gravel is a

---

tween which, as in the midway, is *Perivale*, more truely *Purivale*, &c. &c. Yet doth not this so fruitful soyle yeeld comfort to the wayfairing man in the winter time, by reason of the claiesh nature of the soyle: which, after it hath tasted the autumne showers, waxeth both dyrtie and deep: but unto the countrie swaine, it is a sweet and pleasant garden, in regard to his hope of future profite, for

The deep and dirtie loathsome soyle
Yeelds golden gaine, to paneful toyle.

'The industrious and paineful husbandman will refuse a pallace, to droyle in these golden puddles.'

The wheat of Heston was so famous, that Queen ELIZABETH, as is reported, had the most part of her provision from that place, for *manchet*, for her Highness's own diet.

* The basis, or greater part of this soil, is supposed to be sand.—*J. M.*

leaden coloured tenacious earth, used by tile-makers, of great depth.

On the east side of the county, the whole way from Tottenham to Enfield-wash, the superstratum is of the same light nature; of from six inches to two feet in depth, on a gravel of small flints, which can only be dug for the repairing of roads to the depth of from two feet to five, owing to its then putting on the appearance of a quicksand, so filled with water as to prevent all deeper digging. This is occasioned by the compact leaden-coloured subsoil before mentioned, which prevents the rain-water subsiding to any greater depth.

*Sandy Loam**—Will include all the land between the Colnbrook and Uxbridge roads, on the west side of Hanwell and Hounslow, of from eighteen inches to upwards of five feet in depth, on six or eight feet of the gravel of flints on a subsoil of impervious leaden-coloured earth.—Of this description is the south side of the parish of Harefield, and the parishes of Twickenham, Isleworth, Ealing, Chiswick †, Kensington, Fulham ‡, Brompton, and Chelsea: at several of the latter places the soil has been most highly enriched by cultivation and manure.

Strong Loam.—All the land from Ryslip and Ickenham, on the west, to Greenford, Apperton and Harrow, on the east, and between Pinner on the north, and Northcote on the south, is composed of strong loam. The land about South Mims is also of this kind.

---

* This soil is supposed to contain a less proportion of sand than the last.—*J. M.*

† The soil of Chiswick, is from a strong to a tender or sandy loam; and from a rich and fertile, to a white and sharp sand and gravel.—*P. F.*

‡ The district of Fulham, consists of a light black and fertile soil.—*P. F.*

The lands round Harmondsworth, consist of a light loam and gravel.—*P. F.*

The

The level between Islington, Hampstead, and Hornsey, is a strong but very productive loam.

Loamy Clay *.—Such is the north aspect of a hill between Uxbridge-common and Harefield, the land north-west of Ryslip, the greater part of Hanger-hill, a wood near the east end of Hillingdon-heath, and the land between the river Brent and Hampstead, on the Hendon road. The meadows on the north-west side of Hendon church, towards Page-street, are of nearly the like kind: much of this parish, indeed, is of a clayey nature, yet there are patches of sand, and more of gravel. From Nightingale-hall, by Colney-hatch, to Whetstone, the land is of a loamy clay, mixed with pebbles of flints: and from Potter's-bar, for about two miles towards South Mims, the soil is the same. The north side of Highwood-hill has a thin skin of loamy clay on a subsoil of yellow clay; and in many of these places, the subsoil is a yellow clay, but all the varieties abound with rounded flints.

I have not met with any of this land on the borders of rivers in Middlesex, nor much on any level low ground, nor on the tops of the highest, but generally on the tops of the lower hills, and on the sides of all. All the hollows, bowls and chinks, are filled with gravel, as nuts may be contained in a bason. This is particularly visible in soils that have been but little or not at all cultivated, as Enfield-chase; and it is a most unpromising circumstance to the cultivator of such an obdurate and variable soil.

Clay.—The most adhesive and ungrateful soil known; very different from marsh land; the deposit of water. Every other upland soil, contributes some of its richest particles towards the formation of marsh land in low situa-

* This soil is generally called clay, and so is the leaden coloured impervious subsoil before repeatedly mentioned.

tions; but clay scarcely any, and it suffers even animal matter to be washed from its surface.

It is no wonder there should be such a diversity of opinion respecting the management of clayey soils, when opinions upon the *nature* of clay are so very discordant. Many of our writers on agriculture, indeed, err so greatly, as to call the most highly enriched sediment, or deposit of large rivers, by the name of clay. Others have denominated the half-dissolved chalky marl of Essax, Suffolk, and Norfolk, by the same name, and hence they have attributed great fertility to clay, a quality which I have never found *real clay* to possess. How, indeed, can a soil that is naturally tough, gluey, and sticking to every thing brought in contact with it, while wet; and assuming a stony hardness when dry, possibly be deemed prolific? Its pores seem to be shut up or closed in wet weather; and in dry summers, it appears to be equally ill calculated to permit the free and easy growth of vegetable roots. It is certain, that corn, grasses and herbs, root very little into it. The ploughing it up (where it lies so near the surface as to be accessible to the plough), is injurious to the surface soil and future crops. In Middlesex, it is called 'ploughing up poison.'

I believe tobacco-pipe clay, the snow white clay of Cornwall, and the clay used in making the Staffordshire ware, are equally enemies to vegetation.

Peat.—The moors near the river Coln, the whole distance from Rickmansworth to Stains, consist principally of peat, on a substrata of the *gravel of flints*, which every here and there shows itself at the surface; peat has also been found on the borders of the river Lea, and in the Isle of Dogs.

Marsh Land.—The deposit of still water, is a peculiarly rich loam; very different from the loam of uplands, and equally

equally so from clay. It abounds with the richest parts of every soil, and of animal and vegetable substances which have been dissolved and washed from all the higher grounds, villages, towns, and cities. The Isle of Dogs, which contains near 1000 acres; most, or all, of the land on the flat borders of the rivers Lea and Coln; some inconsiderable quantity of land on the sides of the Brent; the small islands in the river Thames, and many pieces of land situate in the various nooks and windings of that river, come under this description.

SURFACE.

This county, from its gentle waving surface, is particularly suited to the general purposes of agriculture: it being sufficiently sloping to secure a proper drainage, and at the same time without those abrupt elevations, which in some places so much increase the labour and expense of tillage; and from its being entirely free from large stones, those powerful enemies to the free operations of the plough.

It is true, it can no where make pretensions to what is called the picturesque: no rugged woody mountains, nor craggy ivy-bound rocks, here present themselves to intercept the traveller on his way, or to captivate the fancy of the painter; but the more chaste, beautiful, and ornamented scenes, may be found in many parts of the county. The inequalities of the surface which we meet with in this district contribute to health, ornament and beauty. Here are not many dingy heaths, nor sombre-coloured woods, to offend the sight in the gay season of May; but shady groves, diversified plantations, and meandering rivers. Numerous villas, ornamented grounds, lawns, and medallions of beautifully flowering shrubs, almost every where

present themselves to the view of the traveller; which, together with the great number of lofty spires, and gay carriages, cannot fail to remind him of being in the vicinity of a metropolis which may very justly be called the centre of commerce, wealth, and fashion.

Having thus attempted to give a general idea of the face of the county, I shall now proceed more particularly to describe the varieties in the surface of it.

The north border of the county is high ground, and, by the shelter it affords, adds considerably to the fruitfulness of the other parts.

The principal hills are Highwood and Hendon; the hill at Barnet; another between that place and Elstree; also Brockley-hill, which, together with Highgate and Hampstead hills, are the highest in the county. Their summits are nearly of the same level, which is about four hundred feet above the level of the tide*.

The soil on the north side of all these hills, is evidently more chilled, and less productive, than on the south side.

From Norwood to Cowley, for a length of six miles on the Uxbridge canal, the surface is eighty-five feet above low-water mark at Brentford-bridge; at Uxbridge it is

---

* I think Hampstead is a little higher than Highgate, and as it is considerably higher than Harrow, and most other ground in the county, I shall estimate its apparent height in the following manner, viz. as near as I can judge by the eye, it is a small matter higher than the top of St. Paul's cross; therefore, suppose St. Paul's church-yard to be above the tide - 30 feet
The height of St. Paul's is said to be - - - - - - - - - 340 feet
And I think Hampstead is higher by about - - - - - - - 30 feet
which several dimensions make Hampstead to be above the level of the tide - - - - - - - - - - - - - - - 400 feet, as I have stated.—*J. M.*

ninety-

ninety-six feet; and in the meadows near Harefield it is one hundred and seven feet above the said mark.

All the land to the south of the road passing from Brentford through Hounslow to Longford, is so nearly level, as to have no more than a proper drainage, and much the greater part of it is less than ten feet above the surface of the river Thames at Stains-bridge, and not more than from three to five feet above the level of the rivulets flowing through this district.

From Stains, through Ashford and Hanworth commons, to Twickenham, a distance of seven miles and an half, is a perfect level, and generally of from ten to twenty feet above the surface of the river Thames.

Hadley is a village consisting of small genteel houses, on high ground for this county; the land composed of a loamy gravel of flints; and on that side next the common, it has a charming view down the vale over East Barnet to the river Thames. This place affords one of the many proofs round London, that even a very poor soil on a hill, is more valuable than the richest soil in a low situation; for this hill is naturally of the first description, but owing to its elevation, and overlooking some more fruitful and pleasant vales, it has acquired an higher value than the most productive valleys. The same observation applies to Hampstead, Highgate, and many of the high grounds in this county.

Round the one mile stone on the Kingsland-road, the surface is lowered from four to ten feet (average five) by the earth having been dug and manufactured into bricks over an extent of 1000 acres or more; and except where the owners of the soil have been negligent of their interest, and where the works are now carrying on, it has been levelled, ploughed, and laid down to grass. it is sufficiently dry, and by the aid of town manure, is restored

again into excellent grass land*, previously having yielded to the community, through the medium of the brick-makers, upwards of 4000*l.* an acre†, on an average of the whole level; but there are a few acres of choice marl earth, which have produced, through the same medium, 20,000*l.* per acre‡.

---

* The following observations were received in a letter from Colonel CLITHEROW.—"It may not be amiss to call your attention to the valuable article of *brick earth*. It has appeared to me, when the soil has been carried away, the greatest attention should be paid to the manuring and cultivation of the fields so dug: the ease with which manure is procured from London, would very soon replace the damage arising from removing the soil. It does not appear that sufficient attention is paid to the quality of the manure, neither does it appear that the lands are properly drained. The brick earth itself is so valuable an article, it seems to engross the ideas of the proprietor, without considering the quickest method of recovering the soil."—*James Clitherow.*

There is generally a difficulty in getting the brick-makers and gravel-diggers to level the mounds occasioned by their works, and in leaving the soil dry; in a very few instances, indeed, they have even sunk the surface so much, as to occasion ponds of small extent. The best remedy for this, and other matters of a like nature, would be, for the owner of the soil, or his agent, to make the most especial agreements or leases; and afterwards to give such attention as would secure the covenants being duly executed. It would promote this end, to sell the earth at per thousand on the bricks, to be regulated by the quality of the soil.—*J. M.*

† Four million of bricks, at 25*s.* is -	£. 5000	
Deduct for brease, - - - - - - -	1000	
Produce of brick earth, -	4000	
‡ Three feet surface, three millions, at 25*s.* is -		£. 3750
Three feet of second malms, - - at 40*s.* is - -		6000
Four feet of washed malms, - - at 60*s.* is - -		12,000
		21,750
Deduct for brease, &c. - - - - - - - - -		1750
Produce of the brick earth, - -		£. 20,000

At the price of bricks in 1802, these several sums would be one half, or 50 per cent. more.—*J. M.*

The

The bricks called grey stocks, were sold in 1802 at 40*s.* per thousand; place bricks at 30*s.*; second marl stocks at 60*s.*; the best washed marl stocks at 80*s.* These prices include 6*s.* per thousand for carriage.

About twenty-five or thirty years ago, the sum usually paid by the brick-maker to the owner of the soil for an acre of brick earth, was 100*l.* But the price of this, like other things, is much advanced, and it is now from 300*l.* to 500*l.* per acre. The better way seems to be, for the proprietor to receive from one shilling to half-a-crown per thousand on the number of bricks, and, after the earth is completely manufactured and carried away, to have the ground left in a level state, fit for the reception of manure and grass-seeds.

Every four perches superficial, at four feet deep, affords brick earth sufficient to make 100,000 bricks. Four perches are one-fortieth part of an acre; therefore multiplying 100,000 by 40, gives the number of bricks in an acre, namely four millions: that is, one acre, at four feet deep, produces four millions; consequently, every foot in depth of the proper soil, is capable of supplying a million bricks.

In case the owner of the ground should bargain with the brick-maker to receive 1*s.* for every thousand bricks, that would be equivalent to 50*l.* for every foot in depth, which might be ascertained by the number of feet which the brick-maker lowers the surface, or more accurately by the excisemen's books.

The

The brick-maker pays in labour, for digging the earth in autumn and winter, about 40*s.* per hundred thousand, that is per thousand, nearly ..... £. 0 0 5

Soiling and turning 30*s.* per ditto, or per 1000	0	0	4
Moulding and stacking, per 1000, ...	0	5	0
Setting and burning, per ditto, ...	0	2	0
Skintling, per ditto, ...	0	0	3
Loading the carts, and keeping the accounts of sales, 2*s.* to	0	2	6
Brease, ashes, sand, straw, barrows, and other implements, ...	0	7	6
Gratuities, beer, &c.	0	2	0
	1	0	0
Excise tax, ...	0	5	0
Suppose the clay or earth to cost	0	2	0
And every expense per thousand will be ..... £.	1	7	0

In May 1805, place bricks sold in the clamp at 29*s.* per thousand, and grey stocks at 38*s.*

The brick-fields lie close to the town, where manure is to be had in any quantity; and as the carriage costs but little, they are repeatedly dressed, by which means they soon recover their former fertility. There are many who object to such a manufacture being suffered in the neighbourhood of the metropolis, considering it offensive and unwholesome. On the other hand, it is contended that fire is a great purifier of the atmosphere; and that in close and hot weather, a number of brick-kilns near London is of real use to the health of the inhabitants, by promoting a circulation of air.

SECT.

SECT. V.—MINES AND MINERAL STRATA.

THERE are no mines in this county.

The mineralogical strata of the earth, in this county, generally lie in the following order:

First, Cultivated surface.

Secondly, The gravel of flints, five or ten feet in thickness.

Thirdly, A strong leaden-coloured earth, generally called clay, varying from one to two or three hundred feet in thickness. This soil is in some parts of the county manufactured into tiles, and it bears such water-like stains, as to make it probable that it has been deposited from water.

Fourthly, Marine sediment, sometimes cockle, but principally oyster shells, agglutened together, and hardened into a kind of stony strata, of three, four, or five feet in thickness.

Fifthly, Loose sand, gravel, and water.

This strata has been dug into in many places, for the purpose of water, which then rises in such large quantities, as to have hitherto prevented any attempt to dig deeper.

No metallic strata has been discovered in any part of the county, and appearances indicate, that all such lie at a depth much too great to be made subject to the operations of the miner. Rich mineral treasures are mostly found in lime-stone, schistus argilite, or secondary granite; and as these lie, in this district, at a depth much below the reach of man, it is very unlikely that any metallic vein should be found.

The

The external appearance of the land in this county, is most unfavourable to every idea of its containing metals, as there are none of those barren places, which indicate poisonous exhalations rising from large masses of rich ores.

The raising coal or iron from mines in this county, may perhaps not be impossible, but it is very improbable. The soil, so far as it has been tried, does not indicate the existence of either of these substances, and the water which supplies our deep wells, seems to bid defiance to being drawn off by our most powerful hydraulic machines.

The very circumstance of the surface of the county being flat, seems to indicate its being without any important quantity of metals. Mineral exhalations rising from deep recesses of the earth, can more easily ascend between the adjoining acclivious sides of stony strata, than through the dense clays of the plain; and as the stony strata, which certainly passes, though at a great depth, under flat countries, have some of their edges raised to the surface, on the tops and sides of hills and mountains, these operate as so many chimneys among builders, or as worms in the distillery, to favour the ascent of mineral vapour. When this vapour rises in the winter season, and approaches the cold and mostly freezing atmosphere, particularly in places highly elevated, some of it may probably be condensed in the fissures and veins of stony strata, into solid metallic ore. This seems to be the origin of such metals (except iron) as are lodged so near the surface of our planet, as to be come at by the works of man.

Mr. LITTLE and Mr. BROWN, in sinking a well at Paddington, in the year 1802, near the one mile stone on the Edgeware-

Edgeware-road, discovered a strata of fullers'-earth, at a considerable depth, and so thin as not to be of any importance.

For mineral springs, vide Section VI. Water.

SECT. VI.—WATER.

This county is most excellently and abundantly supplied with this very necessary and useful article.

The principal river is the Thames, which is divided, as before described, by this county and Surrey, for about forty-three miles, navigable the whole distance. With this river are connected inland navigations, which make a communication between it and the waters of the Severn, the Mersey, and the Ouse; and consequently a connexion with the trade of Bristol, Liverpool, and Hull. The largest ships in the service of the East India Company can safely come up this river, to the edge of the county at Blackwall. It is navigable for West India ships to London-bridge, and for barges, along all the southern border of the county. This river is rendered famous by the port of London, in every commercial part of the world. The tide flows for about 23 miles up the Thames along the side of the county.

The Thames, from Oxford to Maidenhead, falls about twenty-four feet every ten miles; from Maidenhead to Chertsey-bridge, nineteen feet every ten miles; from Chertsey-bridge to Mortlake, thirteen feet per ten miles; from thence to London, one foot per mile; and the fall gradually diminishes till it is lost as the river approaches the sea.

To

To this noble and capacious river, the county of Middlesex, and indeed the kingdom in general, is much indebted for the assistance it affords; not only as an easy and cheap conveyance of the products of our island from one part of it to another, but also as being the means of bringing to our very doors, the various productions of the whole habitable globe: serving, at the reflux of the tide, as a useful drain to carry off the superfluous water and filth of the capital, and surrounding country: then, by the wonderful operations of Nature, returning to us with its excellent streams purified and refined, ever presenting a new and inexhaustible supply of fresh water; an article indispensable to the comfort of man *.

* From the river Thames, by means of the extensive water-works at the Middlesex end of London-bridge, a part of London receives a never-failing supply of water, conveyed in pipes, laid under the streets, in almost innumerable ramifications. "Also the water-works at Shadwell, which were first established in 1669, serve a district containing nearly 8000 houses, besides public buildings, extending from the town to Limehouse-bridge, and from Whitechapel to the river Thames. It is worked by one of BOLTON and WATTS' improved engines, which has the power of raising the water at the rate of 2853 tons 152 gallons in a day of fourteen hours, the usual time of working it."

Again at Hungerford, there are established the York Buildings water-works, which serve to supply that part of the town which is in their immediate vicinity.

In addition to this liberal supply of water received by the inhabitants of London and its neighbourhood, from the Thames, at these several places, there are also some considerable water-works at Chelsea, "which were constructed about the year 1724: a canal was then dug from the Thames, near Ranelagh, to Pimlico: where there is a steam engine erected to raise the water into pipes, which convey it, in various directions, to the village of Chelsea, to Westminster, and various other places at that end of the town. From these works the reservoirs in Hyde-park and the Green-park are also supplied.

"In a calculation of the quantity of water supplied daily by the several water-works in the neighbourhood of London, anno 1767, those last-mentioned (Chelsea) are said to yield 1740 tons."

It

It is beautifully and characteristically described by Sir JOHN DENHAM, in the following lines:

> Tho' deep, yet clear; tho' gentle, yet not dull;
> Strong, without rage; without o'erflowing, full.

The fish that are occasionally taken in the river Thames, are sturgeon, salmon, tench, barbel, roach, dace, chub, bream, gudgeon, ruffe, bleak, eels, smelts, and flounders; whereof the three last are particularly good.

The river *Lea*—which forms the eastern border of Middlesex, is also particularly convenient to the inhabitants of that part of the county. Upon this river a very extensive trade is maintained, both by this county and Essex.

The river *Coln* enters this county on the extreme north-west corner, and on the border of Hertfordshire, in two or three natural channels, in which manner it gently flows along the west side of the county to near Longford and Colnbrook, where it is subdivided into six branches: the three principal continue their separate courses along the western border of the county, till they join the Thames a short distance west of Stains; a fourth branch winds its way from near Longford, by the eastern end of Stains, through Littleton, to the Thames between Shepperton and Sunbury; a fifth branch from near Longford, till it joins the river Cran, near the gunpowder mills on Hounslow-heath; and a sixth, from near Longford, passes near Stanwell *, over Hounslow-heath, through Hanworth, Bushey, and Hampton-court parks. The

* This stream is used here for the purpose of irrigation; and this is, I believe, the only place in the county where water is thus usefully applied.—*J. M.*

three

three last-described branches flow through a large tract of level barley soil, at only from one foot to five below the surface; which might with perfect ease (as far as water and proper levels are concerned) convert all this district into water-meadow. This river is principally applied to the purpose of working the several mills that are erected over it.

The river *Brent*, which rises in Hertfordshire, enters Middlesex near Finchley; and after taking a circuitous course through the centre of the county, forms a junction with the Thames at Brentford (the county town), which derives its name from this river*.

The small river *Cran* takes its rise in the common fields between Pinner and Harrow, and after passing under Cranford-bridge, and across Hounslow-heath, enters the Thames at Isleworth, in its course dividing the western half of the county nearly into two equal parts.

The *Serpentine river* in Hyde-park†, was made about the year 1730. The water is supplied by a small stream which rises near West End, Hampstead, passes by Kilbourn-wells and Bayswater, and thence through Kensington-gardens and Hyde-park, to the Thames at Ranelagh. This rivulet is very frequently dry in summer, and in such dry seasons the Serpentine is supplied by the neigh-

* Though this is called the county town, it is a miserable dirty place, without a town-hall, or any building of that nature.—*J. M.*

† "Hyde-park, by an actual survey in 1652, contained about 620 acres, valued at 894*l.* 13*s.* 8*d.* per annum; the timber on ditto, valued at 4779*l.* 19*s.* 6*d.*; the deer at 300*l.*; the materials of a lodge 190*l.*; and those of a building designed for a banquetting house, at 125*l.* 12*s.* The park was divided into lots, and being sold to several purchasers, produced the sum of 17,068*l.* 6*s.* 8*d.* including the timber and deer. The present extent of Hyde-park, according to a survey taken in 1790, is 394 a. 2 r. 38 p."—*Lysons's Environs of London.*

bouring

bouring springs, principally by the waste of much pure water which flows from a conduit, of which the city of London have obtained the property, in a close of meadow land near Bayswater, belonging to the Bishop of LONDON. From the spring in this place, the city of London supply many houses in the neighbourhood of Conduit-street with its excellent water*.

These are the principal rivers which, together with a considerable number of smaller streams and rivulets, add beauty and ornament to the county, furnishing at the same time a plentiful supply of water as well as the means of conveyance for the produce of the soil, and returning that necessary article, manure. They serve also the valuable purpose of turning mills, and in many instances, might with great facility be still further applied to the useful purpose of irrigation.

Spring water is to be obtained in many parts of the county, by sinking to a depth of no more than five feet; and in most parts, it is to be found at a depth of twenty feet below the surface; though in the low bottoms of strong

* This seems to have been done by the authority of an Act passed the 35th HENRY VIII. whereby the Mayor and Citizens of London were empowered to search for water, and convey it to the city from Hampstead-heath, St. Mary-le-bonne, Hackney, Muswell-hill, and other places within five miles of the city, upon their indemnifying the owners of the land wherever they should dig, build, or lay pipes (which are described to be of six inches diameter), according as the damage should be valued by commissioners to be appointed by the Lord Chancellor for that purpose. There are no words in the Act which go expressly to Paddington, or the closes in which this conduit is built, and pipes laid; nor am I aware of any other Act having passed, which could convey this conduit and pipes to the Mayor and Citizens of London.

loam, there are some instances of digging one hundred and fifty feet deep, or more, for water*; and even on

* 'In the year 1791, the present Vicar of Northall (Mr. Archdeacon EATON) agreed with Mr. WHITE, of Putney, to sink a well in the court adjoining to the Vicarage. The workmen first dug through a bed of solid blue clay 60 feet in depth; under which was a stratum of rough porous stone about a foot thick. To this succeeded a second stratum of clay (differing a little from the former in colour) 29 feet in depth; then a stratum of fine grey sand, intermixed with extraneous fossils, as oyster-shells, bivalves, &c. This stratum continued for 23 feet; and was succeeded by another of clay, of a red or ferruginous colour, less firm in its consistence than that which occurred before, and intermixed now and then with gravel and stones of a considerable size. After digging through this stratum for 51 feet (at the depth of 164 feet from the surface), water was found; which, on the removal of the stone which lay immediately over the spring, burst up with such force, and in such abundance, that the workmen immediately made the signal to be drawn up. Within the first four hours after its discovery, the water rose to the height of 80 feet; in the next 24 hours about 40 feet more; after which it continued to rise gradually for the next fortnight, till it reached its present level, which is only four feet from the surface of the earth, the depth of the water being now 160 feet.

	Strata.
1. Clay, - - - - - - - - - - -	60 feet.
2. Stone, - - - - - - - - - - -	1
3. Clay, - - - - - - - - - - -	29
4. Sand, - - - - - - - - - - -	23
5. Clay, - - - - - - - - - - -	51
	164 feet.

'Mr. EATON kindly permits the inhabitants of Northall to have free access to this well, though close adjoining to his house.'—*Lysons's Middlesex.*

In 1794, a well was sunk for Mr. VULLIAMY, at Norland-house, on the road from London towards Uxbridge, to the depth of 236 feet; and then a hole, of five inches and a quarter, was bored, and a copper pipe, of the same diameter as the borer, was drove down to the additional depth of 24 feet, into a strata of sand filled with water; a mixture of sand and water instantly rushed upwards through the aperture of the pipe, in such abundance as to rise 124 feet (*i.e.* 100 in the well and 24 feet

on the very borders of the Thames, to a much greater depth*.

'At

feet in the pipe) in eleven minutes, and 119 feet more in one hour and nine minutes, or on the whole, it rose 243 feet in one hour and twenty minutes. A sound line was then let down, which discovered that sand had rose in such quantity, as to fill the well to the height of 96 feet. This was repeatedly dug out, by which the sand was reduced so considerably, as to permit the water to rise through it more and more freely, till it flowed over the top of the well, at the rate of 46 gallons per minute. There still is a great body of sand in the well, through which the water filters by ascent, which is excellently calculated to free the water from every impurity. If a greater supply of water at this well were necessary, for the valuable purpose of turning machinery, it may certainly be obtained after the rate of several hundred gallons per minute, by continuing to clear out the sand, till its obstruction should become of little consequence; but if quality is of more consequence than quantity, Mr. VULLIAMY now has it in a high state of purity, originally excellent water, rendered so by flowing in a strata of clean sand, and further improved by filtering by ascent through many feet in thickness of the same.

* At Mr. MUNDAY's brewery at Chelsea, in this county, a well was dug about the year 1793, to the depth of 394 feet, within 20 or 30 feet of the edge of the river, mostly through a blue clay or marl. At the depth of near 50 feet, a quantity of loose coal, twelve inches in thickness, was discovered; and a little sand and gravel was found about the same depth. The well-digger usually bored about 10, 15, or 20 feet at a time lower than his work, as he went on; and on the last boring, when the rod was about 15 feet below the bottom of the well, the man felt, as the first signal of water, a rolling motion, something like the gentle motion of a coach passing over pavement: upon his continuing to bore, the water presently pushed its way by the side of the auger with great force, scarcely allowing him time to withdraw the borer, put that and his other tools into the bucket, and be drawn up to the top of the well. The water soon rose to the height of 200 feet.—*J. M.*

'On the west of a small brook, which runs by Kilbourn and Bayswater, in the parish of Paddington, where the soil is a deep clay, the springs lie very far beneath the surface: on the sinking of a well here, some few years ago, by Mr. COLSON, the workmen dug near 300 feet before they found water. In sinking this well, the workmen dug through

'At the entrance of Acton, on the London side, is a convenient conduit for the benefit of the public.

'On Hampstead-heath are several springs belonging to the Hampstead water-works.

'There are several springs of mineral water in various parts of the county, some of which have been celebrated for their medicinal virtues, viz.

'About half a mile from East Acton, are three wells of mineral water, springing out of a deep clay, which were in great repute for their medicinal virtues about the middle of the present century.

'On the side of Hampstead-hill, to the east of the town, is a spring of mineral water strongly impregnated with iron, which was formerly much frequented.

'At Bagnigge-wells are two springs of mineral water, one of them chalybeate, the other cathartic.'—*Lysons.*

---

a bed of bluish clay to the depth of about 100 feet, when, after passing a thin stratum of stone, they came to another bed of clay of the same quality and colour; through which they dug, without further interruption, till water was found at the depth of nearly 300 feet from the surface.

'In digging another well in the same neighbourhood, water was found at the depth of 250 feet, which rose with great rapidity till it came within 70 feet of the surface, after which it continued to rise very gradually, a few feet higher, at which height it stopped.'—Vide *Lysons' Middlesex.*

Mr. John C. Falck suggests the propriety of 'stocking all the reservoirs and waters belonging to canal navigations with fresh-water fish; and says, that in Germany, the fish-ponds form a special part of husbandry, and which Russia has introduced and adopted all over its empire, as a great source of nourishment to the poor country people.' He adds, that 'it is entitled to some attention as an article of commerce, and that the spawn of sundry fish for the said ponds, might be procured from the continent.'

If Mr. Falck means Prussian carp, they are not of any value.—*J. M.*

CHAP.

CHAP. II.

STATE OF PROPERTY.

SECT. I.—ESTATES, AND THEIR MANAGEMENT.

AN increasing wealth, among the more numerous classes of the community, has a direct tendency to produce the division and subdivision of landed property; and accordingly we find, that, as the number of this description of persons is larger, so estates are less extensive in this county, than in any that are remote from the capital.

The increase of money, by means of general industry in trade and commerce, among the inhabitants of the metropolis, necessarily induces those persons who have large properties to dispose of, to divide them into as many lots as can conveniently be done, in order to increase the number of purchasers: as it is a well known fact, that estates will sell for a larger sum, when thus divided, than could be obtained for them in one lot.

From this circumstance, I apprehend, the number of the proprietors of land is still on the increase, and so also is the number of those gentlemen who occupy their own property, many of whom keep their grounds in such a superior state of cultivation and embellishment, as would render it a desirable task for any person of competent talents, to collect and describe their several excellencies and beauties. But as a work of that kind, however pleasant,

would occupy several volumes, it is obviously incompatible with the limits of this Report. I might perhaps have ventured on the description of a few of the principal estates; but as that would necessarily occasion the omission of many others, some of them, perhaps, of greater merit than those I might happen to select for my purpose, and as a preference in this case might not be altogether well received, I hope I shall be excused for leaving this part of my task to some more able pen.

Estates are, for the most part, under the management and direction of attornies-at-law, whose attention to these concerns seldom extend any further than to receiving the rents at their own houses or chambers, generally in London, and in drawing leases from old precedents. Many of these gentlemen are as respectable characters as any in London, but they are not at all skilled in the business of agriculture; which, from the nature of their profession, cannot be expected. They generally neglect matters equally essential, such as protecting the land against a repetition of corn crops, and of taking care that the buildings, fences, gates, stiles, ditches, and drains, are kept in constant repair. Now, instead of this supineness, a manager of landed estates should be active to promote and encourage the improvement and advantage of the property committed to his care, as well as the comfort and convenience of the occupiers, by every possible means. He should labour to remove the shackles which ancient practices and ignorant notions have in many instances rivetted on the minds of husbandmen; and at the same time recommend the best and most improved methods which may be employed in every country, and according to every soil and circumstance. He ought to avail himself of the cheapest and most effectual methods of covered, open, and mill draining. He should understand how to apply

water

water to the beneficial purpose of irrigation, either by taking it from natural levels, or raising it by machinery, from rivers, ponds, and wells. It is necessary likewise, that he be acquainted with the best and most improved implements of husbandry at any time in use, for the dispatch of business, and for the better cultivation of arable land, so as to keep it always clean and in good heart. It will still further be necessary, that he be ready at selecting the most judicious rotations of green and root crops, for the rearing and fattening sheep and neat cattle on the land; and also, that he should, by every honourable means, promote improvements in live stock. If an agent suffers any part of an estate under his care to become either foul or exhausted, it is evident that he either does not understand, or neglects to execute, the duties of his office.

If all these matters were performed with judgment, the rents in this county would in a few years be very considerably increased: in many instances from 20 to upwards of 100 per cent.

The advantage and good management of estates might be still further promoted by a liberal treatment of the tenants: by granting well advised leases, and by timely renewals; by allotting to each farm a sufficient number of cottages for the accommodation of a requisite proportion of labourers; by attaching to it a proper quantity of marsh land, to supply it with hay or pasture in every season; and by an equitable proportion of good and bad land, at least so far as local circumstances will permit.

The managers of large landed properties fill so important a station in society, by reason of the prosperity of agriculture; the interests of the landlords, that of the tenants, and the community, being all committed to their talents, integrity, and sedulous attention to the duties of their profession, that I hope it will not be deemed superfluous

fluous that I have thus, though slightly, sketched what appears to me to be the most prominent features of an intelligent and active land-steward.

Those authors who are advocates for placing farmers at liberty to till and crop the land according to their own inclination, are little aware what destruction would be committed under such a system.

The history of every such farm would be, that such parts of the land as happened to be in aration, would be successively cropped with corn, until it would not yield any more; then the pastures would be ploughed and treated in the same manner; and lastly, such of the meadows as were dry enough to admit of being ploughed, would be exhausted in a similar way. The owner of such a farm would then find it of less than half its former value; and he would be reduced to the necessity of doing one of two things, namely, either to recover the land by an enriching but expensive system, to accomplish which he perhaps has neither the skill, the industry, nor the means; or to lett it for less than half of what it would have produced under more careful management.

To these permit me to add, that it is well known to every intelligent incoming tenant, to be of importance to the success of the estate, to have leases expire at Michaelmas, in preference to any other season of the year.

For more, see Rotation of Crops, Leases, &c.

SECT. II.—TENURES.

There is much freehold, a considerable portion of copyhold, and some church, college, and corporation land.

Copyhold

Copyhold estates in this county are mostly, if not entirely, of inheritance, subject to fines and heriots. In some manors the fines are certain, and so small, that the tenure is little, if at all, inferior to freehold; in others, they are at the will of the lord, that is, subject to pay two years of the full rent as a fine. Questions have been made, whether the lord, having granted license to his copyholder to lett on building leases, is not entitled to have two years according to the rents of the houses built thereon; but this would be attended with the total ruin of the copyholder. Suppose the present rent of his land to be 5*l.* an acre; he letts it on a building lease at 15*l.*; the builder erects houses worth 500*l.* a year: if the lord insists on a fine of 1000*l.* it is very greatly more than the value of the copyholder's whole estate, as he can receive only 15*l.* a year during the lease which he has granted with the lord's consent. If he does not take admission, the lord will seize, after three courts are held, as for a forfeiture. If the copyholder imprudently takes admission without a previous agreement as to a fine, he is subject to an action for recovery of it, and must be ruined.

If, under these circumstances, the copyhold descends to an infant, and no one applies on his behalf for admission, there can be no real forfeiture: the lord is to admit some one for him, and appoint a guardian, who is to receive the rents, and thereout pay the lord's fine; but as the ground-rent never can pay *such* a fine, it will in effect deprive the infant of his estate as fully as a forfeiture would have done. If this should be law, it seems highly necessary that the Legislature should interfere.

In Harrow there are some who are called head copyholders, and have this *seeming* advantage, that the heir at law pays no fine on his admission; and one of these copyholders

holders having been once admitted, may purchase any other copyhold, or all the copyholds in the manor, and pay no fine, and they will descend to his heir in like manner; but if he sells, the lord may impose on the purchaser what fine he pleases; for instance, one thousand pounds, though the copyhold itself should not be worth one hundred pounds. The consequence to the copyholder is, that the seeming advantage of the custom restricts the sale to so small a number of purchasers, that he cannot get near the value which his estate would be of under a common tenure. One way of getting rid of this is, by the purchaser, being a stranger, coming to a previous agreement with the lord, and giving a bond that he or his heirs will not avail himself of the custom. Sir JOHN RUSHOUT, late lord of the manor, offered to change this into the common custom as to fines, but the copyholders refused.

CHAP. III.

BUILDINGS.

SECT. I.—HOUSES OF PROPRIETORS.

THIS county, from the circumstance of its containing the capital of the most considerable commercial nation in the world, is distinguished by the number and magnificence of its buildings; the consequence of a great influx of wealth, produced by the general industry of an enterprising people.

Besides several royal palaces, the two houses of parliament, the courts of law, the several public offices, and a great number of hospitals, Middlesex has to boast of many most magnificent mansion-houses, belonging to the nobility and wealthy commoners, as well in the metropolis as in the country; and also of a very numerous list of elegant villas, and modern built houses of great value, the property of most respectable men.

A description of the palaces, mansion-houses, villas, parks, paddocks and pleasure-grounds, would be sufficient to occupy several volumes; but as they have little reference to the direct purposes of agriculture, it will scarcely be expected of me to enter on that task in a work of the present kind.

I shall take this opportunity to remark, that if the nobility, gentry, and proprietors of landed estates in general, were to make a point of keeping a farm, consisting of arable, meadow and pasture land, in their own occupation, and

and near their respective country residences, it would add considerably to their pleasure and amusement; and if conducted on the most improved principles, it would have the effect of teaching the neighbouring tenantry the best practices in the several branches of husbandry, by the most powerful of all means, namely, example.—These being dispersed pretty equally over the island, *every district might then be said to have its experimental farm*; not only affording considerable profit to the owners, but at the same time a very high degree of gratification to them, in being looked up to, by their tenants and neighbours, as models of perfect management, while they are further conferring blessings, and rendering the most substantial and permanent services to their country.

SECT. II.—FARM-HOUSES, OFFICES, AND REPAIRS.

THE oldest farm-houses and offices now in the county, are built with timber, lathed and plastered, and the roofs thatched; which sufficiently indicates, that at some distant period they were generally so. These buildings appear to have been erected by piece-meal, merely to suit the immediate wants of the farmer. Of the houses, many are in villages; others in low sheltered situations; often on the side of a green lane; and frequently near a pond. In the arable part of the county, the offices have been added one after another, in proportion as the woods were cleared, cultivation extended, and the requisitions of the farmers increased. Being built with timber, they endure repairing, after every vestige of the original materials are perished and gone.

Those farm-houses that have been built within the present century, are generally erected with bricks; and, owing

ing to the high price of straw, and the great value of manure, the roofs are now, for the most part, covered with tiles.

The modern and recently-built farm-houses and offices are, with few exceptions, well constructed, and are kept in pretty good repair. Some of them are perfect models of their kind, particularly at Sutton-court farm, in the parish of Chiswick, now in the possession of Mr. THOMAS RUSBERRY; and the farmery of the late JOHN ROBINSON, Esq. at Wick-green, in the parish of Isleworth. The latter indeed exceeds every thing of the kind, and well deserves the inspection of gentlemen who, regardless of expense, may have it in contemplation to erect the most complete set of new and elegant offices for an *extensive farm*, and which is to be in their own occupancy. The bottom of this farm-yard appears to be well covered with chalk, and is rendered dry by means of grates and drains, which convey the urine of cattle and water from the dung-hills into a bason-shaped hollow place, or pit, at a small distance, where it is soaked up by mould, litter and refuse of every sort placed there for that purpose. The pit is in this manner annually filled with matter of a highly putrid nature, and carted on to the land, which it greatly contributes to fertilize. Every farmer ought to imitate this easy method of acquiring much excellent manure.

The farm-houses are most of them placed with a proper attention to convenience and usefulness; though, in the arable part of the county, where the farms are in common fields, many of them are at a very inconvenient distance from the land. But this is the necessary consequence of the land being in common, and is one among many more reasons, why it should be enclosed.

Many hay-farmers have only a stable for their horses, and an open shed for loaded carts to stand under, in addition

tion to the dwelling-house and its offices. Others have a shed for a cow, and a barn (without a thrashing-floor) which they fill with hay. Some of these barns are fitted up with deal linings, partitions and floors, in a very complete manner for the purpose of suckling house-lambs; and the second crop of hay is either placed at one end of the barn, or adjacent to it, for the use of these lambs.

Many of the modern farm-houses in the hay district of the county, have pretty much the appearance of gentlemen's houses, both in construction and neatness, partly owing to there being no farm-yards with cattle. And even in the arable part of the county, there are but few yards of this description, as the straw is nearly all sent to market.

Thatch certainly keeps out both the summer's heat and winter's cold, much more effectually than any other material now in use for the purpose of covering houses and other buildings; but as it is not quite so compact and sightly as either slates or tiles, and withal, the straw being of so much value for other purposes, it will probably be entirely superseded by them. Pan-tiles are so easily heated through by the sun during the summer months, that the rooms underneath are as hot as an oven: while in the winter season, in every common frost, these tiles are so completely frozen through, as to become as cold as a covering of ice. These extremes must consequently have a very bad effect on the health of the inhabitants. The blue slates are so very thin, as to be equally liable to the same objection, particularly as they are now laid on most of our fashionable houses, under WYATT's patent. They are rather better when laid on in the common manner (*i. e.* double) on laths, but much better on boards. *Plain tiles make a considerably more temperate covering for houses than either pan-tiles or slates*, by reason of their being laid

double

double and in mortar, and thereby forming a much thicker and closer roof. In this they are nearly equalled by the thick or stone slating of the midland counties; *they might also be glazed of a slate colour, in which case they would make a roof more handsome, temperate and durable, than any other covering material now known.*

In order to promote a more equal temperature of the rooms, lath the under side of the rafters, and fill the space between them and the slates or tiles with straw, neatly drawn in by hand.

If it were necessary to have barn floors for the purpose of thrashing on, a very good method of laying them may be found in the Derbyshire quarto Report, page 52. But two such floors will cost as much as a *thrashing-mill*, and at last the said floors imperfectly answer the intended purpose; whereas the *mill* will not only be found to thrash the corn perfectly clean from the straw, but may also be so constructed as to be applied to many other useful and economical purposes.

SECT. III.—COTTAGES.

COTTAGERS who live on the borders of commons, woods and copses, are a real nuisance, from the circumstance of a considerable part of their support being acquired by pilfering. In such situations, most of the cottages are erected with the connivance of the lord of the manor; too often in conjunction with two or three copyholders, who are perhaps overseers of the poor. The erecting a cottage, and placing a poor family on the waste, and close to a wood, is a certain means of relieving the parish at the expense of the proprietors of such property.

This

This kind of grant, made in the front of other land, in the vicinity of London, or any increasing town, is a serious loss to the owners of such land, as much of its value depends on its fronting a road or a green, and also in not having an unsightly cottage close to it.

The habitations of most of the married labourers are built with brick, and tiled, and are situated in the towns and villages. Some of them have been erected with quartering, weatherboarded and tiled: two cottages under one roof, with very small gardens, each of them from three to four pounds a year. In Ryslip, Pinner, and in some other places, there are several persons who have a more ordinary cottage, and the superior convenience of an orchard and garden, at about fifty shillings a year.

Cottages, and houses of every description, are usually considered as having a right attached to them, which entitles the occupier thereof to cut bushes, turf, heath, peat, and such like things, for fuel, on the commons within the manor in which they are situated, or of which they are held.

The meanest cottage may be considered as having as much common-right belonging to it, or rather perhaps, as exercising that right to as great an extent, as the largest mansion. The instances are very rare, in which more than one fire in a house is constantly supplied with such fuel; and this is more likely to happen in the poor man's hut than in the gentleman's villa. The inhabitants of cottages also usually feed as many *geese and pigs* on the commons, as the occupiers of larger houses; and as these are held to be the only common-rights belonging to houses, it is evident there is no greater right of common attached to the higher rented house than to the cottage. So far as the houses only are concerned, they may be considered as equal, and in fact, they have been so valued by commis-

commissioners employed in carrying into effect different acts of enclosure.

It is, I believe, a general rule adopted by such commissioners, to come to a resolution on the average annual net profit which the houses in the district have been accustomed to draw from the commons or wastes then under consideration, for the purposes of *fuel, and in feeding of poultry and hogs on them; and then, and from those circumstances, to allot to each house so much land as in their opinion will be a fair equivalent.*

In many instances, these house or cottage-rights have been valued at from twenty to forty shillings per annum each; and were it possible in all cases to set out a portion of land of like value, so as to adjoin their little dwellings, and for the inhabitants to have it *rent-free, as they previously had the common*, their condition would be greatly ameliorated. But as a method to accomplish this desirable purpose, and at the same time to render equal justice to the landlords, has not yet been contrived, we find the poor cottager has hitherto been obliged to pay rent for what, it might be said, he enjoyed for nothing while in a state of commonage. And yet it is with a cheerful heart he pays such rent, when he can have in *severalty*, adjoining his own door, that which, being in *common*, was not perhaps of half the value: on the contrary, it is to be lamented that this small pittance of land is generally allotted with larger portions of the common, in satisfaction of other claims made by the same person, and all lett together to a farmer, or occupied by the proprietor. In this too common case, the cottager is bereft of his former common-rights, without receiving any consideration whatever to console him under such a loss; consequently, his situation is made so much worse than it was before, by the value of his former rights, namely, twenty or forty shillings a year.

This is a melancholy picture; and is a sufficient reason for the opposition usually given by cottagers to enclosing the commons; but where shall we seek a remedy? *It appears to me, that an effectual one can only be found in a law directing, that every allotment of land that shall be made in lieu of the common-right belonging to any cottage or tenement, shall be set a-part exclusively for the use of such cottage or tenement, as near to it as possible, and for ever afterwards occupied by the poor person who may dwell therein for the time being.* Although by such an arrangement, the *cottager* would become chargeable with a rent for the allotment, yet it would be found that the extra industry which would in consequence be exerted by *him*, and the greater supply of manure raised on this little farm (if it may be so called), would double the value of it, both to the landlord and to the community, in a few years, and his net profits would, as near as need be estimated for the present purpose, be as much as his privilege on the common had ever produced him.

Further, the herbage of all land set a-part for public purposes, as gravel-pits, and the sides of roads, &c. might be reserved for their sole use and benefit *.

These things, if attended to, and the allotments to such poor persons made rather more liberal than usual, would put them in possession of what, to a poor family, must be a very great comfort, *a spot of ground whereon to grow escu-*

---

* The following observation is copied from one of the returned Reports:—'It has been proved in a variety of instances, beyond all possibility of doubt, that the exercise of the right of cutting fuel upon a common (such as turf, ling, &c.) is not half so beneficial to the poor as their constant labour being required in the cultivation of the same soil. A portion of the wages will purchase fuel of another description, such as coals or wood, at a much cheaper rate.'—This may be true in particular cases, but it is not generally so.—*J. M.*

lent

[illegible] roots for the supply of their tables, and perhaps, in some instances, the still greater advantage of being able to support a cow *.

Cottagers having land at a fair rent sufficient to keep a cow, a pig, and poultry, all the year, are very seldom chargeable to their parish. The very great policy as well as humanity in providing as many poor as possible in this manner, no longer admits of argument; the thing is proved beyond all doubt by Mr. ROBERT GOWRLAY, in the Annals of Agriculture, v. 37, p. 524, and p. 599.

If some such scheme as the foregoing were pursued, on the meditated general enclosure of the waste land in this country, particularly the idea of annexing to each cottage a small piece of land for the purposes before-mentioned, it would, I conceive, not only tend to the principal, and avowed object of *ameliorating the condition of the humble but useful cottager, but also help to reduce the poor-rates, render the labourers more orderly, destroy the disposition to pilfering, which is now far too frequent, and more firmly attach them to their superiors, and their native soil* †.

CHAP.

---

* 'Wherever the cottages have an acre or two of land, the benefit of it is felt by the cottagers themselves in the greatest degree, and by the occupiers of land in the lowness of the poor-rates, and in the industry and good order of that description of labourers. These small portions of land are generally well managed, and made the most of.'—*Rutland Report.*

† Copy of a paper, drawn up from Lord KENYON's observations on the common-right of cottages, made in the Court of King's-Bench, 11th Feb. 1795.

Lord KENYON said the Court would not interfere more in the execution of enclosure bills, than to put the Commissioners in motion: they should be left to their own discretion. If the Court should once give way to applications of this kind, they might open two or three more Courts in the Hall, that would have nothing else to do. It was doubtful whether cottages had any common-rights at all: a cottage and garden could have none. It could not support a cow, nor any allowed commonable cattle,

CHAP. IV.

MODE OF OCCUPATION.

SECT. 1.—SIZE OF FARMS; CHARACTER OF THE FARMERS AND RURAL ARTIFICERS.

SIZE of Farms.—The farms of this county are in general small, especially when compared with Sussex, Wilts, and other counties, where large downs or sheep-

during the winter. Many of them might be encroachments from the waste, made with the connivance of the lord of the manor; and all such could have no common-rights, unless they had been so encroached and enclosed time immemorial. By the law of England, no estate was entitled to common-right for more cattle than were levant and couchant, or than could be wintered upon the old enclosure. A cottage with a rood of land could scarcely be supposed able to support a cow; pigs it might have, but he doubted whether they were commonable cattle. Geese were not cattle; they were animals not commonable; hence he thought a cottage and garden could hardly have any common-right, except as to fuel, and that might be from sufferance, or connivance, and it must be time immemorial that could constitute a right.—*J. M.*

The cottagers of England have, so long as geese have been known in this island, depastured them on the commons, which I hope is sufficient to give them as certain a right of common as the farmer has for his ox. The same observations apply as to swine that are secured against turning up the soil.—*J. M.*

It is a notorious fact, that cottages not having any ground belonging to them, promote thieving to a great extent; as their inhabitants constantly rob the neighbouring farms and gardens of roots and pulse sufficient for their own consumption; and which they would have no temptation to do, if they had the same articles growing of their own. Hence this evil admits of an easy remedy, namely, allot to each cottager a piece of ground.—*J. M.*

walks

walks constitute a part of the farms. Hanworth Park, containing 600 acres, lately occupied by Mr. EDWARD JENKINS; Mary-le-bonne Park, containing upwards of 500 acres, and other land occupied by Mr. WILLAN; the manor-farm at Paddington, and other farms occupied by Mr. HARPER; and the farms of Mr. RHODES near Islington, are probably the largest in the county; each of the three last mentioned gentlemen pay from two to five thousand pounds per annum, for the rent of their respective farms, which are all in a state of grass, and principally occupied by cows for supplying the town with milk. There are many farms of about 200 acres; but perhaps the average of the county would not exceed 100. Near great towns, small farms of good land are so much better suited to the purposes of a gardener than a husbandman (his art being more beneficial to the public, to his landlord, and to his family), that the gardener should in such situations have the preference.

A few acres of good loam are equally suitable for a nurseryman, and are sufficient for his purpose. But in more distant places, a farm of twenty, or even fifty acres of ordinary arable land, is much too small for the employment and support of a family, at the present high price of the necessaries of life. Farms which are under fifty acres, should, wherever the nature and quality of the soil will admit of it, be in grass. This would allow the renter of it to have a separate employment.

With respect to the long-disputed subject of great and small farms, which has occasionally occupied the attention of every man concerned in rural pursuits, my opinion is, that, it is sound national policy for the country to be in such a state as to accommodate every possible description of men, who, by inclination, or otherwise, are disposed to become occupiers of land; and it seems to be clear, that

in order to suit every extent of capital, there ought to be farms of almost every size: these things do not seem to require any more controul than such as shall secure the most perfect cultivation of every acre of the soil. Though it will be admitted by every man who has had opportunities of making extensive and accurate observations on the produce of land, that it is rather the larger farmers and yeomen *, or men who occupy their own land, that introduce improvements in the practice of agriculture, and that uniformly grow much greater crops of corn, and produce more beef and mutton per acre, than others of a smaller capital.

The small farmer cannot mix with the world, he cannot afford to travel in order to improve his mind, and as the whole body of such men consider book culture as the *ne plus ultra* of absurdity, they take care never to be guilty of the folly of reading. They cannot incur the expense of any other implements, than those of the worst construction; their horses, neat cattle, and sheep, are of an inferior kind. These circumstances demonstrate the vacancy of their minds, and their incapacity for conducting any business, otherwise than in the worst manner. And, unfortunately, these men have been the cause, in some measure, of the cultivators of the land in general being assigned, by popular opinion, an inferior rank in this enterprising nation.

Large farms generally have, or mostly may have, the advantage which arise from the same person occupying land of different quality, and that can with propriety be

* It should seem to be necessary to define every word, since on a late occasion, a court of law referred to a jury for their verdict, to know whether a common soldier was a yeoman or not? they returned that he was: perhaps another jury may determine, that a man who occupies his own land is a common soldier.—*J. M.*

worked

worked in opposite seasons, and therefore require fewer labouring cattle. The larger farmers obtain some degree of education; they read, perhaps the publications of the Board of Agriculture; they travel and converse, sometimes, with the very professors of Agriculture; therefore, they not only now are, but will at all times be better informed than the small ones; and they have also more capital per acre, which last circumstance is powerfully calculated to equalize the price of things at market. The advantages of employing superior intelligence and capital, cannot fail of raising from the soil an increased quantity of provision, and that, with steady markets, as certainly is the most likely means of supporting a greater number of people. Therefore it appears clearly to be the interest of the landlords as well as of the community, to encourage this description of men, who, by their superior intelligence, and from the advantage of a sufficient capital, are able to obtain a greater produce from the land, and at the same time, by judicious management, increase its value.

It is universally found, that farmers who occupy more land than is proportioned to the capital they have to employ in the cultivation of it, cannot possibly keep the arable part of their farms clean. It necessarily becomes filled with root weeds, by means of which the produce is reduced in quantity to about half what it *ought* to be, and indeed what it *would* be, under the management of a man of larger capital. So also with respect to grass land: such persons cannot keep a sufficient number, nor a valuable sort of sheep and neat cattle, to stock it completely. From these circumstances it generally happens, that they remain poor, and unable to cultivate their land to the best advantage: and were all our farmers of this description, the children

of our labourers would die with hunger, for want of the necessary supplies being brought to market.

No person should occupy more land than his property and talents will enable him to cultivate in the most choice manner. Pastures which contain shrubs, rushes, or coarse grass, should not be allowed to continue in so unprofitable a state. No sheep-downs, sheep-walks, or waste, should by any means be permitted for the mere purpose of filling the bellies of lean sheep, which are intended to empty themselves at night in the fold on the arable land, as such a practice ruins all the grass land which is used in that manner. If any regulation, for the entire cultivation of all these coarse pastures, downs, and sheep-walks, could be enforced, it would soon circumscribe within proper bounds the size of every overgrown farm, as they are invariably only so, by reason of the great quantity of such land attached to them.

A deficiency, in point of number, of farm-houses and appropriate offices, is one cause of farms being larger than is compatible with the best interest of the nation: this is the case, in a remarkable degree, on the south and west country downs, and likewise in some other places; but it is a deficiency that ought to be maturely considered, before the proprietor of a landed estate should come to the resolution of increasing the number. Nothing in this way can be erected for less than 800*l.*; the building should then be insured from fire, and kept in perpetual repair. These expenses, and five per cent. interest on the first cost, will amount to 50*l.* a year, or 10*s.* per acre on a farm of 100 acres of land. It is obvious, that the occupier of such a farm cannot afford to pay this annual rent for the house and offices of his farm; and it is equally certain, that his landlord ought not to lay out 800*l.* in building,

building, without receiving 50*l.* a year for it. In most cases of this kind, true policy advises the owner of the soil to refrain from building, and to lett his land to some neighbouring farmer, who fortunately may have the necessary number of buildings.

Great Britain is becoming more and more occupied by large farms, and great manufacturing towns, which tendency is occasioned, in part, by the unprofitableness of farm-buildings; but still more by the superior profits which other professions afford over agriculture. It is not an easy matter for a young man of promising genius to procure a farm, of which he can have a lease, and that will enable him to support a family: of his acquiring a considerable fortune, there is little or no chance. It is much more likely that he should be able to establish himself in trade, in manufacture, in commerce, or in some liberal profession. In any of the latter employments, men of superior energy generally acquire a fortune, and sometimes of great magnitude, which enable them to live in much splendour. Most of the towns of any consideration in Britain, have instances of persons accumulating much wealth by manufacture, by merchandize, and by the law. The fortune being acquired, mostly leads to honour, and sometimes to titles. In agriculture, these things never happen, consequently, persons of ambitious minds leave the plough to the pursuit of men of a more humble disposition. Other professions hold out many great prizes in the lottery of life; whereas agriculture, till within these few years, was so much neglected and despised, though most unjustly, that she could only offer to her votaries those things which sour the temper, oppress the mind, and keep its professors poor.

Character

Character of the Farmers.—The farmers, or cultivators of the soil of this county, may be divided into various classes, or descriptions of persons.

In the vicinity of London, the ground is mostly rented by cow-keepers, gardeners, and nurserymen. The land lying immediately beyond the last, is occupied by the villas of wealthy citizens and others; and at a still further distance, by farmers, who are again divided, first, into persons with whom farming is but a secondary object (their primary occupation being generally in London), and who do not pay to it that attention which is necessary to make it profitable.

Secondly, into persons who, having acquired an easy fortune in other pursuits, retire to farming, with the idea of uniting profit and amusement in their agricultural labours. There are many of this class, who know nothing either of the theory or practice of agriculture; but having hastily imbibed a notion that it is a very pleasant pursuit, enter into it with great precipitancy, and generally quit it again in two or three years, after having suffered considerable loss, from having laid out large sums of money, some of it in useful improvements, without waiting to receive a return for their labour and expense. They then quit their farms in disgust, and leave them for others to reap the fruits of their industry.

The third is a less numerous class, and consists likewise of persons who have been in a different line of business, yet have had such a strong inclination for rural occupations, that they abandon their former employments altogether, and betake themselves wholly, and without reserve, to farming of land, as a profession. This class forms the most intelligent and most accurate of husbandmen. Like converts in religion, they have more zeal, give more applica-

application, in short, have fewer prejudices to surmount, and more enthusiasm for their new profession, than those who have been brought up in it from their infancy. They are, however, at the first outset, more liable to error or mistake, from the want of practice; but their indefatigable attention makes more than amends for their ignorance of the *minutiæ* of the art; and as they have been at some pains to acquire a knowledge in the theory of agriculture, and hence established their ideas on rational principles, they most commonly in the end make a distinguished appearance, as their labours, if judiciously performed, though often in a new and experimental channel, seldom fail of being crowned with success. The number of cultivators of this description, is, however, very limited. Of this class was one of the best farmers in the county, lately deceased, who had been a tailor.

The fourth and last class is about equal in number to all the rest, and is composed of persons who are farmers by profession, and who have at no time been engaged in any other line of business: these, as a body of men, may be said to be industrious and respectable, and much more intelligent than the generality of farmers in places more distant from the metropolis. But there are some exceptions to this general respectability, as may be seen in the following case. After the quitting of a yearly tenant who has greatly wasted the land he occupied, if the landlord should commence an action against him for such misconduct, it is usually referred to the arbitration of a barrister at law, who, having no skill in rural concerns, so as to form an opinion of his own on a view of the farm, he proceeds strictly according to the evidence produced by the contending parties. The landlord, therefore, cannot recover, by means of this arbitrator, any thing from the visible deterioration and exhausted state of the land; but,

on

on the contrary, is put into the difficult situation of being obliged to prove, by actual witnesses to the transaction, that the tenant carrried off the dung, the crops, the timber, &c.; also where the hedges have been destroyed, he must prove that there were hedges during the time of this tenant; and so on. This man may certainly have carried away many loads of each, or all, of these articles, but as the witnesses can only swear to one or two of them, the value of the one or two will be all he can recover. In the first instance, perhaps, one half of the articles will be lost, from the attorney's not having mentioned them in his declaration, and nine-tenths of the remainder, owing to the witnesses not being present at the time the depredations were committed. As to the other tenth part, the tenant meets his landlord on the merits of the question, and can and will, in all such cases, bring forward a set of low farmers, who are obliquely interested in the decision of the cause, to swear that they have done the like, and their landlords did not bring the matter before a court. This will be sufficient to induce the arbitrator to determine, that it is the custom of the place so to do, and award in favour of the tenant. Perhaps, indeed, the landlord may be fortunate enough to prove a trifling article of waste, the value of which will be awarded to him, and each party be ordered to pay his own costs. This is not an imaginary case, but one that actually occurred about twenty miles from London, in the year 1796; and although the landlord had, in the opinion of two or three persons of competent judgment, been plundered to the amount of 300*l.* or upwards, and notwithstanding both himself and his son were attornies, yet *he received only 5l. and had to pay his own costs, which, as between attorney and client, would amount to* 100*l.*

I suppose there is not a landed estate, of any considerable

rable extent, in Great Britain, but what is occasionally depredated and despoiled in the manner here stated, which can only be attributed to defects in the law, the want of effective leases, timely renewals, and a more strict attention on the part of the proprietors.

The landlords have a very difficult part to perform, in order to protect their estates against deterioration. A tenant for a year has it in his power to do much waste with impunity; a tenant by lease for years, or for life, can avail himself of the negligence of his landlord, his steward, or of defects in his lease; and if by a miracle, one of these is vigilant, and the other well drawn, he then will have the weight of the courts of justice to hold the lessor to the performance of his covenants to the utmost extent of them; and on the contrary, to explain away, undo, and render useless, every covenant that requires any thing to be done, more than paying the rent, by the lessee. I lament extremely when I hear, as I sometimes do on trials of ejectment for gross breaches of covenant, the Judge ruling, that (notwithstanding the parties have so contracted, and the waste has been fully proved) forfeitures are odious in the law, and then, by unreasonably blaming the landlord for bringing the action, induce the jury to find for the tenant; when, in common sense and common honesty, the landlord who seeks for the fulfilment of his contract, is acting meritoriously, and the tenant who voluntarily breaks a covenant, which he knows he has bound himself to perform, is a bad man, and on him, not only the odium ought to be fixed, but all the ill consequences of his having acted so perversely.

In order to make good farmers, the roads should be kept in repair to their very doors; canals should be near; well-drawn contracts or leases should be general, and literally enforced; many oppressive things should be removed; and

and there should be a certain, good, and ready-money market, within a reasonable distance, for the produce of their farms *.

Character of the Rural Artificers.—Manufactories appear to be the parents of ingenuity and excellence in mechanism; and wherever they abound, it is observable, that a portion of that spirit infuses itself into the rural artificers of that district. The ordinary wheelwrights and smiths of Middlesex have no ideas of machinery, nor have they a capacity for executing any thing from drawings or specifications. The generality of the farmers' labourers are equally stupid, and unwilling to execute their work in any way to which they are not accustomed. Hence, the difficulty of introducing any thing new in the implements or practice of husbandry, is almost insurmountable. Even the most trifling alteration, or deviation from the old system, is resisted, both by the artificers and labourers; and every possible obstruction thrown in the way of the farmer, to prevent what they deem an innovation on the established customs of the place. It is absolutely impossible to get a plough, a thrashing-mill, a winnowing-machine, or indeed any other implement of husbandry, made on a good principle by the country artificers of Middlesex; and

* In the year 1778, the inhabitants of South Mims used to assemble in vestry to the number of twenty-five; only two of the number could write their names. At this time (1798), they generally can write and keep accounts.

In the same parish there lived a farmer, in the year 1796, when wheat was 16*s.* a bushel, who had 50 bushels in ten sacks. The apprehension of a famine acted so powerfully on his mind, that he placed his sacks of wheat in his parlour, and locked the door, as a reserve for the use of his own family, saying, "this is the first time of my parlour being so well furnished." He kept it there till the price fell to 10*s.* and then sold it at a loss of 15*L.*—*G. B.*

it

it is not much less difficult to induce the labourers to use them when they are brought from any other place. Thus the farmer is reduced to the necessity of treading in the steps of his grandfather, though the practice may be at war with his own judgment and inclination.

It is true, we have a BRAMAH, a COOK, a MACDOUGAL, and some other ingenious and sensible mechanics, residing in this very county, and who are fully competent to execute any order for every kind of instrument that can be useful or necessary to the purposes of agriculture. Yet their labours are less valuable than might be supposed, by reason of the unavoidable wear and tear that every implement used in the business of farming must undergo, the impossibility of getting them skilfully repaired by the country workmen, and the great expense and loss of time which would be occasioned by sending them for that purpose to the original maker.

Specious writers on agriculture, who have not themselves experienced these difficulties, are too ready to condemn the whole body of husbandmen, as obstinately resisting every improvement, when at the same time they are not aware how much they subject *themselves* to the retort of being deemed superficial observers of the subject, in thus frequently bestowing censure on the farmer, instead of applying it to his labourers and artificers.

SECT. II.—RENT.

THE rents are, without exception, all paid in money, with the addition of some few instances of supplying the landlord's family, in town, with fresh butter at 8*d.* or 9*d.* per pound, of sixteen ounces; and with cream at 6*d.* per pint.

pint. They are made payable quarterly, but are mostly received half yearly, and the payment is actually made about three or four weeks after Lady-day and Michaelmas in every year. This might be rendered more convenient to the poorer tenants, by delaying the receipt of the Michaelmas rent till the latter end of December.

The rent of land in this county, varies from 10*s.* to upwards of 10*l.* per acre; which great disproportion is here, as every where else, occasioned by a variety of circumstances: such as the natural quality and aspect of the soil; the distance from London and other markets; the goodness, situation, and convenience of the buildings; the state of the walls, hedges, and ditches; the expense of conveying the produce to market, and of obtaining a supply of manure in return; and also, whether it is by land or water the products are to be carried: the state of the roads; the expense of toll-gates, weighing-engines, and markets.

There are likewise many other matters which repress and keep down the rent of land, particularly tithes, taxes, assessments, and the heavy losses sustained by theft; nor does the damage done by hunters, shooters, and others, who trespass on the farmer's ground, and damage his crops and live stock, pass without lowering the landlord's rent. The number of public-houses in the neighbourhood of the farm, and between it and market, is also a tax on the landlord; and so is the general depravity of morals, and the want of docility in the labourers, and skill in the artificers, and a thousand other things, which the proprietors of land have not supposed to be inimical to their interest, are so many drains which reduce the rent of land to a moiety of what it would be, if such ingenious devices were not contrived, to enable others to share the produce of the soil with the farmer and his landlord.

Besides

Besides the direct payments, in the way of tithes, taxes, and assessments, which vary even more than rent, and the other burthens hereinbefore enumerated to be sustained by the farmer, he has to bear the very great expense of manure, together with the high price and astonishing quantity of labour; therefore it is obvious, that it must demand some skill, a great deal of attention, and industry, to derive a living profit by the cultivation of land so circumstanced.

My opinion accords with the sentiments of the respectable Author of the View of Argyle, that 'The occupiers of land, whether in pasturage or tillage, ought certainly to be able, like labourers or tradesmen, to live by their occupation, and to support their families by their daily care and labour. The interest of the money invested in their stock, with the proper allowance for tear, wear, and risk, they should be able to save, as a provision for their families, and for old age; as the money so invested would give this return, if laid out on interest, without any trouble whatever. It certainly is not any part of the produce of the ground, and therefore no part of it ought, in equity, to enter into the payment of the rent; and yet not one in ten, perhaps, is able to save it; nor do they commonly advert, that so much ought to be saved.'

The method practised by some gentlemen, of estimating the produce of land by trebling the rent, is very fallacious: three times the rent is not by any means equal to the value of the produce of land under any system of husbandry now in use; though under the old exploded course of fallow, wheat, oats in the scanty produce of common fields, and when taxes, and other expenses, were less than half their present amount, it was not very distant from the truth. The real proportion which the rent of land bears to its produce, is becoming successively less:

formerly it was one half, then one-third, lately one-fourth, now less than one-fifth, and every increase of taxes will reduce it still lower in the scale; in short, it is now threatened with being reduced to a seventh, an eighth, a ninth, or even a tenth part of the produce of the land.

Every improvement in both agriculture and manufactures, has a tendency to raise the rent of land. Practical agriculture is now approaching a pitch of excellence; if that should be aided by improvements in manufactures, and happily by the extension of commerce, rents may be expected to rise in a very extraordinary manner. The reverse of these things is calculated to reduce the quantity of wealth, and lower the rent of land; therefore rent rises and falls with the prosperity or declining state of the agriculture, the manufactures, and commerce of the nation; and, as such prosperity can only be expected in times of peace, consider, O ye landlords! how much you have sacrificed by the loss of such a blessing.

SECT. III.—TITHES.

In many parishes within this county, the tithes are taken in kind, and which is nearly the same, in others they are annually valued, and compounded for. In several parishes, a reasonable composition is taken; in some it has been very little advanced during the last twenty years; happily there are farms which pay a modus, and others that are entirely tithe-free.

Within the narrow limits of my own knowledge, several premeditated bills of enclosure have been given up, rather than the land should be subjected to yield tithes in

in kind, on being enclosed from a common, after the great expense of the act, the commission, the survey, the making of new roads, the building of bridges, the fencing, and erecting new buildings, and cultivating the land, has been incurred. In all such cases, the tithe laws have prevented the extension of cultivation.

The operation of tithes is well known to keep down, or reduce the produce of the earth, to much less in quantity than it would otherwise be, and of course to increase the price of bread, and promote our dependence for it on the importation of corn from foreign countries, which could with ease be raised at home.

Dr ANDERSON says truly, that 'agricultural improvements are effected by the expenditure of money in labour and manure. Every person applying his money for these purposes, does it with a view of being repaid the interest of his money with profit. The profits depend entirely on increasing the produce of the soil: no increase, no profit. Great produce alone can create great profit; of course, the exertions of the husbandman will be stimulated by every circumstance that has a tendency to add to the amount of that produce, as they will be slackened by every circumstance that tends to diminish its amount; consequently, the tithe which takes from this undertaker one-tenth part of such produce, must greatly reduce his profits, discourage his exertion, and be a great obstacle to agriculture.'

The advocates for the cause of tithes calumniate the people of England, by saying their national clergy would not be well supported by any other means. It is more truly said by an eloquent author, 'I am much gratified to see, that all the disputants in favour of the abrogation of tithes uniformly agree, that an order of men who are separated from the world, and excluded from other lucrative professions, for the sake of the rest of mankind, have

a right to be furnished with the necessaries, conveniences, and moderate enjoyments of life, at the expense of those for whose benefit they forego the usual means of providing them: what is proposed, therefore, is the commutation of tithes, not that the National Clergy should have their emoluments diminished, but that the decent and liberal maintenance assigned them, should be accommodated to the new circumstances in this country which the spirit of improvement has occasioned.'

Another well-informed writer says, 'Tithes unquestionably operate as a bar to *improvement*; for which reason, and also with a view of terminating all such disputes and ill will as they are the cause of, between parishioners and their pastors, the effects of which are highly injurious to society, I would warmly recommend a commutation. I am firmly of opinion, that our clergy and religion might be better supported without the power to take tithes in kind, than they are at present; or under a proper commutation, they would both stand on a more respectable, opulent, agreeable, and secure basis. The following plan of commutation would secure to tithe-holders the full value of their property: namely, the Legislature might enact, that commissioners should be appointed to ascertain the proportion which the tithes for many years past have borne to the rent of land, and that the same proportion of all present and future rent should be paid in lieu of tithes. Thus would the payments of the farmers be fixed for the term of their leases, which would secure to them the advantages of their improvements.' This plan seems simple, easy of execution, susceptible of such regulations as would prevent fraud, and it would increase with the rents of the country.

The Vicarages in particular would be improved by any system of commuting tithes; and the holders of all other

small

small livings are now so much distressed by their incomes being inadequate to their support, that they cannot too soon supplicate the Legislature to provide for them a more suitable provision. For these and other reasons, which I forbear to name, it appears very clearly to be highly the interest of the Clergy in general, to contribute by every justifiable means towards obtaining a general commutation of tithes; and it is equally clear, that the price of the public funds, and consequently the sinews of a strong government, would be best supported by selling the tithes for stock, as hath lately been done by the land-tax: and the Legislature having thus taken that part of the provision for the Church under its protection, for ever makes itself answerable for its adequacy.

I was prepared to say a great deal more on this head, and to show beyond the power of argument to controvert, that tithes taken in kind, operate against the improvement of agriculture, and consequently against the institution and labours of the Board, as well as powerfully repress and keep down both the prosperity and population of the British Nation; and are the worst provision both in respect to the clergy and to the public; but as this National Institution refrains from observing on several things which oppress husbandry, and also does not feel itself at liberty to point out some great impediments which are in the way of improvement, my sentiments on the subject of tithes, and some other matters, are constrained from appearing otherwise than in a mutilated state.

SECT. IV.—POOR, AND THE RATES FOR THEIR RELIEF.

THE rates are from 6*d.* to 7*s.*; perhaps 3*s.* 6*d.* would average the county.

The following is an abstract from the overseers' returns to parliament, for this county; extracted from a printed Report of a Committee of the House of Commons, dated 23d May, 1787.

MONEY RAISED BY ASSESSMENTS.

	£.	s.	d.
For the year 1783,	207,953	16	5
For the year 1784,	211,819	9	8
For the year 1785,	212,964	14	11
Medium of those three years,	210,901	9	4

EXPENSES NOT APPLICABLE TO THE POOR.

Medium of money applied for county purposes, including vagrants, militia, constables' expenses, prosecutions of felons, county bridges, gaols, houses of correction, &c.	8,746	18	3
Medium of expenses for repairing churches, roads, clocks, stocks, pounds, salaries to ministers, parish-clerks, sextons, watchmen, &c.	6,639	0	1
Medium of net money annually paid for the poor,	195,526	11	2
Net expenses for the poor in 1776, taken from the returns then made to parliament,	174,253	1	3

HEADS

HEADS OF PARTICULAR EXPENSES.

Medium expenses of overseers, in journeys, and attendances on magistrates, &c.	1,436	15	6
Medium expenses of entertainments at meetings relative to the poor, ...	1,695	6	3
Medium expenses of law business, orders, examinations, and other proceedings relative to the poor, ...	5,129	7	7
Medium of money expended in setting the poor to work, ...	1,380	7	8

It is only the blind, the extreme old, the very young children, and idiots, which become chargeable in a parish purely agricultural.

A labourer in agriculture is more likely to support his family without assistance from the parish, at twelve shillings a week, than a journeyman in any large manufactory, though his earnings should be a guinea, or a guinea and an half *.

Crowded work-houses are the sinks of vice; for in them the old and the young, the healthy, and those afflicted with loathsome diseases, the necessitous and the abandoned, are all mixed in one house, or perhaps in one room. Here the young, the unfortunate, and persons of weak yet honest minds, repeatedly have their ears assailed

* In the parish of Merton, in which is my country residence, we have several large manufactories of calicoes, and, as a necessary consequence, many pattern-drawers, &c. whose earnings are from one guinea to one guinea and a half per week; but these never pay the poor-rates: the fear of their families becoming chargeable to the parish, prevails over the vestry so much, as always to prevent persons of that description from being required to pay.—*J. M.*

with infamous oaths, and descriptions of every species of vice, deception, and theft. The scene is in the highest degree horrid, and infinitely surpasses any powers of description.

The idea of supporting a large family at a less expense per head than a small one, has led us into sad extremes. The supporters of such a system, neglected to estimate the effect of that general contamination of morals, which always takes place in situations crowded with paupers of every description; as well as the impossibility of preventing frauds, and of effecting the most prudent management, in large work-houses, or houses of industry, such, in short, as in the end to have the effect of more than doubling the expense; and which is calculated to be perpetually increasing, in something like the proportion of compound interest.

The difference in favour of small, or thinly inhabited parishes, when put in comparison with such as are large and populous, as to the expense and orderly behaviour of their poor, is astonishingly great. Hence the latter should divide and subdivide their poor, in order to put them on the advantageous terms of the former.

All the really necessitous, and who only want a part of their support, should be assisted in their own houses, where five shillings will frequently go as far as twenty would do in the work-house.

The Rev. JOHN HOWLETT, speaking of the means used for lowering the poor-rates in his parish of Dunmow, attributes it to two causes: first, a determination in the parish officers to spare their money to the utmost; and, secondly, by admitting as few as possible into the work-house, where, experience had taught them, that the maintenance of the poor is much more expensive than out of it. The consequence was a large decrease in the rates.

For

For distressed objects, who of necessity must have the whole of their support from the parish, there should be a sufficient number of small cottages built, in lieu of a work-house, not all close together, but perhaps in pairs, or at least so much a-part, as to admit of each cottage having a piece of ground, for the production of potatoes, turnips, &c. If widely dispersed over several parts of the same parish, so much the better; they should be made to hold two persons, and one or two children, or in lieu of the children, one or two of those paupers who should be found the most infirm. They should be obliged to assist each other, and to do something towards their own support. Alms-houses are a case in point, where poor persons live, on an average, for half the expense that supports others in a work-house, which incontrovertibly shows the more cheap and superior comforts which cottages afford over work-houses, and likewise the wisdom of erecting them in lieu of work-houses, for the reception of the poor*.

They who are able to work, but who are idle and incorrigible, should be let out to persons who are in the habits of employing and supporting such characters: there are several such in and near London; or they might be committed to the house of correction.

There are paupers in every parish within this county, who might be employed in rolling and scraping the turnpike roads and highways generally, and in sweeping the crossings over such ways, for foot-passengers. The over-

* In the year 1783, some alms-houses were built on the Uxbridge road, for the residence of poor families, with a sum of money given to the parish, as a compensation for the enclosure of a piece of waste. This seems to be a proper application of the money, and deserving of imitation. *—Lysons.*

seers

seers might either undertake the work by contract, or let the poor for that purpose by the day; which would be a benefit to the parish, and a convenience to the public.

Institutions for the relief of the poor of this county, are proportionate to the wealth of its inhabitants. Work-houses, alms-houses, and weekly donations in bread, are provided in almost every parish, for the constant support of the indigent: and the money raised by voluntary contributions, for particularly unprovided cases of distress, amounts, one year with another, to a very large sum, probably in this instance, to more than all the rest of Britain.

The Society for bettering the Condition of the Poor, the Philanthropic Society, the Asylum for providing for Female Orphans, a Society for supporting and teaching the Indigent Blind, another for the Suppression of Vice, and many other institutions, have been established, and are now supported, by the voluntary contributions of the more humane and benevolent inhabitants of London; with the god-like intention of rooting out vice, and preventing, or alleviating distress. The supporters of these institutions show an ardent desire to remove poverty, or at least to make the hardships of it very lightly felt. The benefits which society might be expected to derive from the exercise of these virtues, are rendered nearly abortive by another description of men, who, from motives of interest, are equally intent on increasing the number of public-houses. By way of elucidation, permit me to suppose the whole population of a town to consist of virtuous inhabitants: if, in an evil hour, only one of our ordinary public-houses, a pawnbroker's shop, and a dealer in old iron and other second-hand things, should obtain an establishment there; from that time, farewell much of the happiness of such a people: this trio would introduce more vice

and

and misery into such a place, than could be effectually counteracted by the most unbounded benevolence and charitable contributions of all the good persons in that town. It is therefore clear, that the suppression of these houses would work a greater reform among the poor people of London, than was ever experienced on this side China. If this be too much to expect, why should they not be regulated in such a manner as to prevent much of the mischief?

The funds raised for supporting the idle poor of this county, are so numerous, efficient, and comfortable, as to operate against the general industry of the labouring poor.

Lodging and diet in the work-houses, in every instance, are superior to what the industrious labourer can provide for his family. It is obvious that this must have an influence over their minds, and become injurious to the interests of society. It holds out encouragement to prefer the work-house to labour, therefore it is calculated to fill it with improper inhabitants, and in that manner reduce the amount of industry.

Mr. MALTHUS says truly, that the poor-laws hold out support to the vicious and the idle, at the expense, in part, of the prudent and industrious. The inhabitants of work-houses diminish the quantity of provisions that would otherwise fall to the share of the labourers; consequently they increase the price of provisions, and in that manner they are a tax on the industrious poor. They likewise tend to increase population among the poor, and enhance the price of provisions, and thus depress the condition of those who are not supported by parishes, and consequently to create more poor!

In those parishes with which I am acquainted, the annual expense of each pauper is about fifteen guineas: a stout

stout healthy labourer in husbandry, with a wife and three children, earns only thirty, with which he is required to support five persons.

The earnings of the inhabitants of work-houses, on an average of the whole of this county, does not amount to eight shillings per head per annum; which, taken from the former sum, leaves fifteen pounds seven shillings, or near six shillings a week, as the expense of supporting each pauper. This is a profuse expenditure of parish money, as two-thirds of the whole number of persons would support themselves out of the house, on being allowed only two shillings a week; therefore the whole might be maintained for half the expense incurred under the present system. Nor ought they in any case to be allowed so much as one-fifth of the earnings of a labourer, otherwise their situation is made as good, or better than his.

Among the numerous establishments in the county, charity-schools make a distinguished figure. And I think the great number of children which are now educated by means of the voluntary subscriptions and benefactions of the well-disposed, shows very clearly, that a law for the purpose of raising an annual fund, in order that every child should be taught to read and write, would be well received, and cheerfully acquiesced in. The extensive adoption of Sunday schools, points out the sense that people, for the most part, entertain of the necessity of some such measure as is here recommended.

As matters are now managed, the labourers of this nation have not sufficient interest in its prosperity: but give every child an education, and the parent would feel, that the success and happiness of his children depended on the stability of so humane and wise a Government. This would take from them the occasion of looking to every invader, to procure for them some of those things which

are

are now ungraciously withheld. Were the children of the poor universally educated, a very increased number of them would lead good moral lives: this would procure for them protection and encouragement, which, added to industry and frugality on their own parts, would raise them, though very slowly, yet certainly, in time, to the class of small farmers, artificers, and tradesmen.

In Scotland, the poor have enjoyed for many years the great advantage of parochial schools: it does not seem to me that any sufficient reason can be given for withholding similar benefits from the children of the English, Welsh, and Irish.

The present method of clothing, as well as educating, the children placed in the charity-schools, more than doubles the expense per head, and therefore restricts the benefits of education to less than half the number that it might otherwise be extended to, with the same funds. This system of clothing has also another bad effect attending it, as it induces a false dependence in the parent, and either makes him relax in his exertions of industry, or increases his means of frequenting the public-houses. Every institution which tends to make the poor depend on any other support than their own industry, does them disservice, and is injurious to society, by diminishing the quantity of labour which annually produces consumable goods, that are the wealth of a nation.

The number of the poor is increased in a great variety of ways. I shall only mention a few of them: namely, upwards of one hundred thousand sharpers and thieves committing depredations in and near London, must be ruinous to many, by contaminating the minds of some, and reducing the property of others: the want of economy among the poorer clergy, clerks in public and private offices, and others, who, although their income depends

on

on their health and faculties, yet they mostly expend the whole of it; of course, when such men die, many of their families are reduced to want. The great expense in money, and the equally expensive waste of time, in endeavouring to obtain justice by the very excellent laws of England, is also annually the ruin of many families. I have known two families, consisting together of thirteen persons, brought to the work-house, and maintained by the parish at an expense of about two hundred pounds a year, owing to an imprudent collector of taxes having distrained about twenty shillings on each family. But a still greater number of poor arise from various classes just above want, who are able to support themselves so long as their several concerns go on with success. The least reverse is ruinous: a bad debt of a few pounds, the long sickness or death of the man or his wife, and a thousand other causes, are the ruin of numbers.

I shall not dwell on this unpleasant part of my task any longer than to observe, that it would be surprizing if the number and expense of the poor did not increase, while, under such disastrous circumstances, every fifteenth or twentieth house is licensed to promote idleness, and all the bad consequences of drunkenness. It is supposed there are fifty thousand women* suffered to live in and near London, by public prostitution; dogs are licensed and protected from the shot of the farmer's gun, many of which only serve to hunt the flesh off the flocks of sheep; while horsemen break his gates, and gallop down his growing wheat; gunners destroy his hedges, and let the cattle go astray, to the loss of stock, to the great damage of particular soils and crops, and the unnecessarily increasing the farmer's labour.

* Colquhoun's Police.

The

The industry, care and attention, of many of the middling and lower classes, made with the praise-worthy motive of bettering their condition, are insufficient to bear them up against such a combination of evils, which depress them into classes much lower than they would otherwise hold in society, and finally, into poverty and distress.

The poor's-rate of South Britain in 1686 was 665,362*l.* one hundred years afterwards it amounted to two millions; therefore it had trebled in that time; and it is now increasing in a more rapid proportion.

SECT. V.—LEASES.

It is a very unreasonable prejudice which many proprietors entertain against granting leases of their estates; for the withholding them operates as a powerful bar against improvement, and is as injurious to the interests of the landlord as to those of the tenant and the community.

If the proprietors of landed estates could be prevailed on to grant leases, under good advice, of their farms, they would considerably increase the produce, and consequently the rental, of Great Britain. Leases are calculated to rouse the energy of industrious farmers, by means of the confidence they feel, that they shall certainly reap the profit of their labour, skill and capital, in consequence of their having a permanent interest in the soil they cultivate. Leases, in short, may very properly be said to be the only means for effectually securing the landlord and tenant against the possibility of injuring or distressing each other.

It is well known, that the many valuable and extensive improve-

improvements which have been made on the estates near London, and other great towns, have been effected in consequence of building leases, from sixty to one hundred years, being granted to the individuals who undertook such improvements. This has operated as a sufficient inducement for carrying into effect many very considerable schemes of advantage, which could not otherwise have been perfected. It plainly points out to the landholders in the country, the policy of pursuing the same line of conduct, and the propriety of encouraging a spirit of speculative improvement among the occupiers of their estates; by making it known to them that they are ready to grant leases of their farms for any number of years (perhaps not exceeding one hundred), only proportioning the length of the term, and the rent, to the nature and extent of the improvements which the taker may purpose, or be required to make; estimating that the lessee should be repaid his principal, and at least six per cent. interest, within the term. I have no doubt that if this measure were adopted by the *proprietors* of landed estates, in every part of Britain, it would excite and encourage, among the *occupiers*, throughout the country, a spirit of emulation proportionate to that which has long been so conspicuous in the metropolis.

In order more fully to evince the justice and propriety of granting leases, I shall instance three or four circumstances under which, it appears to me, that it would be highly proper, and much to the interest of the landlord, to grant them from twenty to even one hundred years.

1*st*, In the case of a farm having been exhausted by the avarice and knavery of an out-going tenant, who has taken advantage of the neglect of his landlord, or the mismanagement of his steward; it being required of the person coming into possession to restore the land, by an improved course

course of husbandry, and to deliver the farm up, at the end of the term, in a high state of cultivation; supposing him to pay a fair rent for such a farm, he ought to have a lease of it for twenty-one years.

2dly, If, in addition to these expenses, he should undertake to enclose and cultivate a quantity of waste land; or engage to convert suitable parts of the farm into water meadow; in this case, the lease ought in justice to be extended to thirty years.

3dly, Should any person undertake to drain completely an extensive bog, morass, lake, or large piece of stagnant water, he ought to have of such recovered ground, a lease from sixty to eighty, or one hundred years.

And *4thly*, In the case of a tenant's building farm-houses, barns, mills, &c. or of his gaining land from the sea, it would be right, and proper, to grant him a lease from sixty to one hundred years. In every case, the term should be proportioned to the expense, difficulty, and ingenuity, of the undertaking.

It will sometimes happen, that, in fairness, the rent ought to be much lower during the first two, three, or four years of the term, than afterwards: as the cause which occasions the propriety of the rent being low at first, will probably, by due skill and industry, be removed in a few years; for instance, when farms are unfavourably circumstanced, as in the first and second class before-mentioned, the rent should rise progressively; suppose the first year at one-fourth; the second year at one-half; the third year at three-fourths; and for the remainder of the lease, at the whole of the intended rent. Again, with respect to the third class, the tenant should not be required to pay more for the first three or four years of the lease, than the original value of such ground, in its unimproved state: and for a few years more, the rent may rise progres-

sively, and in proportion to the advancement of the projected improvements, until they may be completed; when the ultimate rent, previously agreed on between the parties, may become payable without inconvenience to the tenant.

On the most mature consideration of the subject, I am decidedly of opinion, that the *community* would, on the whole, derive great advantage from the proprietors of farms granting leases, as they are certainly the most effectual means that can be used, to promote any very considerable improvements in agriculture*. There are few cases in which it would not promote the interest of the proprietors to grant leases of their land, provided they obtain a covenant to authorize them to resume such parts of the premises, on a short notice, as may be wanted for the purpose of attaching to the land occupied with a mansion-house; or for sale; or for the accommodation of any

* Heffleton farm, about four miles west from Wareham, in Dorsetshire, was lett (most likely at a very advanced rent, though I have not discovered what the previous rent had been, nor the state of the upper land) on lease for 60 years, at 140*l.* per annum. The lessee, encouraged by so long an interest in the estate, converted 140 acres of low boggy ground, adjoining the river Froom, into water meadow, which has been flooded at pleasure for about 20 years of the time: he also permanently improved other parts of the farm so much, that on the expiration of the said lease, which happens to be at or near this time, the farm is thought to be worth five or six hundred pounds per annum.

Another instance also occurs to my recollection, which happened about 10 years ago, on the letting a twenty-one years' lease, of the manor farm at Longney, in Gloucestershire. On that occasion, the tenant discovered the means of regularly flooding, from the river Severn, a large and very coarse meadow, which meadow would certainly have remained in its native poverty and ill condition, had not the said lease been granted.

I could also produce some instances of land being now lett at 2*l.* 6*d.* per acre, that would have been worth 20*s.* during the last 20 years, had the owners granted it on lease, even for so short a time as twelve years—

* M

neighbour

neighbour with a few acres of land; or for facilitating the exchange of particular pieces of land; or when it may be lett to a brick-maker or builder. The notice may frequently be as short as a month; but in all such cases, the lessee should be paid for his dressings; and if he should be required to quit any grass land between the first day of May and the end of July, or any arable land while there is a crop growing on it, he should be paid for his loss of crops.

The letting of farms to tenants at will *(or from year to year)* is a most unwise practice, and should by all means be avoided by the proprietors of estates. *Such tenants, from the very nature of their tenure, are precluded from the possibility of making any improvements; but they have it in their power to ruin the land they occupy.*

Rapacious landlords, unskilful stewards, and yearly tenantcy, destroy the tenant's confidence, smother his thoughts of improvement, and, in short, make a bad tenant, by setting him to contrive some mode of occupying the land, so as to be able to quit it on receiving half a year's notice, with the least possible loss to himself; and which can only be done, by keeping the soil continually poor, to the evident loss of the landlord, no less so of the tenant, but the still greater loss to the community.

The immense quantity of ley land in a state the most exhausted and poor, has been so reduced from a respectable degree of fertility, by the occupiers of the soil being permitted to follow their own system; and every farm, if not every acre of land, in the nation, would be brought to a similar wretched condition in less than 20 years, if the renters were allowed to crop it, each man after his own manner.

It should also be considered, that the putting an ill-

conditioned farm into a high state of cultivation, cannot be done at once. Several years are required to carry into effect the best digested plan: it is also attended with a much greater expense, and requires more skill and sedulous attention, than most people are aware of; a great deal more than any farmer *ought* to attempt, and indeed more than any sensible man *will* attempt, without the security of a lease*.

Having said thus much, in endeavouring to prove to the proprietors of landed estates the policy of granting leases, I shall now offer a few remarks on the insufficiency of some, and the impropriety of many more, of the leases which are now in use.

Landlords are, in general, induced to grant a twenty-one years' lease of their farms, in the expectation that it will be the means of such farms being brought into a complete state of cultivation. It is usually left to a lawyer to make the lease, and it has lately been made compulsively so, though such a person cannot have any such knowledge of rural concerns, as is necessary to enable him to draw such covenants as will be in any manner calculated to put the land into a respectable state of cultivation, and secure its being delivered up so at the expiration of the term.

Such leases as are now in use for farms, are a composition of obsolete unintelligible covenants, which tend not only to shackle the tenant, but operate in a powerful manner against the interests of the landlord, which they particularly profess to secure; and the community unquestionably receives, by the means of such leases, an incalculable loss.

If the tenant possesses capital, spirit, and skill, he

* For the danger, to a tenant, of occupying a farm without a lease, see the Report of Selkirkshire, pages 255 and 256.—*J. M.*

restores

restores the buildings and hedges; drains, cleanses, and manures the land. By these means, he gets it into a high state of cultivation within the first seven years of his lease, and keeps it so till within the last five; he then exhausts the land as much as possible, by repeated corn crops, and by the neglect of cleansing it; and, with the land in this foul and impoverished state, treats with his landlord for a new lease, or quits the farm.

From the circumstance of in-coming tenants always having to encounter with an exhausted farm, they are frequently nearly ruined by the expense of bringing it into good order. In every part of this county, the crops sown by any individual, depend on the number of years unexpired of his lease. It is not uncommon for a lease that has four or five years to come, to sell for as many years' rent, on the presumption of what the buyer can draw from the land by deterioration and depredation.

The leases of a very considerable proportion of the arable farms in England, have a covenant inserted in them, requiring the tenants to follow a three years' rotation of fallow, wheat, oats; and to spread a specific quantity of lime every third, or in the fallow year, without any regard being had to the quality of the soil, and the number of years it has been in aration. Under this restriction, only two miserable crops are obtained in three years. This is a very old course, which is to be met with in various parts of England. It probably originated in common field husbandry, but it is a remnant of ignorant practice, which not only ruins the land, but at the same time impoverishes the tenant. This covenant, however, having unfortunately found its way into the precedents of every attorney, it still continues to occupy a place in all leases drawn by *them*, though the injurious tendency of it is so very obvious. I have heard many sensible husbandmen

in various parts of the kingdom, speak of this improper covenant with lamentation, and at the same time declare, they durst not vary from this impoverishing rotation by the production of green crops, as such a deviation from the strict words of the lease, though it were calculated to enrich the land ever so much, would infallibly induce the steward of the estate to give him notice to quit his farm.

From this, and many other instances of the like kind, which I have met with, I am of opinion, that one of the many obstacles to perfection in agriculture, arises from the incapacity of the stewards of landed estates, who certainly have it in their power, by encouragement and support, to introduce every kind of improvement, or by mismanagement, to continue the most erroneous practice. The difference to the landlord may be reckoned at 50 per cent.; to the tenant at more; and to the community at upwards of 100 per cent.

It is in a great measure, owing to the managers of landed estates being insufficiently acquainted with agriculture, that the most improved husbandry, and the most valuable breeds of live stock, are confined to the few, while all the rest are still labouring under the grossest ignorance with respect to this valuable art. Such men are ill qualified to arrange and dispose land into the most suitable and convenient farms, and to point out and describe the best method of cultivating every acre of such farms.

It is really astonishing, that gentlemen of landed property should pay so little attention to their interests and concerns, as to permit their stewards to wink at, or pass over, a tenant's ploughing up any of the rich grass-land of his farm, and take ten, fifteen, or perhaps twenty crops of corn in succession (as is stated in the Wilts, Somerset, Anglesea, and many other Reports), when it is perfectly well known, that the richest soils may be, and indeed very

very frequently have been, so exhausted, as to be rendered incapable of producing a tolerable crop of any kind, by rapacious tenants holding their farms as tenants at will, or under improper leases. Every county in England and Wales abound with instances of this kind; to remedy which, the tenant should be restrained, during the whole term of his lease, from breaking up the prime pastures, or any of the meadow land.

Church and college leases, and leases for lives, are drawn in a worse manner than any others that have come under my observation. The security of the landlords of this sort of property, principally consists in having excited a confidence in their tenants by means of the periodical renewal of their leases. But in all cases, where the owners have come to a determination not to renew such leases, and add young lives as the old ones become extinct, the insecurity and miserable effects of such ill-drawn leases are severely felt by the lord of the manor, at the expiration of them, in every species of dilapidation: the timber is usually mutilated or destroyed; the arable land rendered foul and exhausted, by a too constant repetition of corn crops; the buildings deteriorated, or perhaps suffered to fall into ruins; the hedges neglected or destroyed; the ditches filled up; and the grass-land poached into sterile-mortar. These, and such like cases, strongly point out the incapacity or inattention of the persons who draw such leases; and also, the absolute necessity of a thorough reformation as to the leases of landed estates in general.

In order that the lease or contract for a farm should be drawn with propriety, it seems to be necessary, that a person of competent experience in agriculture should examine both the surface soil and the substrata, the drainage, and different aspects of the several fields, attending at the

same time to the distance of the neighbouring markets, the state of the roads, and other local circumstances, that will present themselves to a man of judgment. He might then determine the rent; and, after arranging his ideas for the best and most perfect management of the whole farm, draw up a few specific and determinate covenants, such as, under all the circumstances of the case, would be well calculated to secure the interest of the landlord, and at the same time promote the success of the tenant; but as there are not many persons who are competent to put the finishing hand to such covenants, and as they are of great importance to the landlord, too much caution cannot be used by him in order to have them made as perfect as good advice can make them; therefore, they should be submitted to the perusal and correction of a lawyer, which would afford a reasonable hope that, by the exertion of such joint experience, a good lease may be obtained.

It should not be expected that any improvement will take place during the last five years of any lease; for certain it is, that the farmer will grow rather sparing of his manure, his clean cultivation, and generally good management, towards the end of his term: consequently, the farm will not shew itself to so much advantage in the last year, as it probably may have done three years anterior to that period: for this reason, it is not advisable to delay the renewal till the last year, but rather to make it about three years before the expiration of the lease, at which time every part of the farm will be more highly conditioned, and consequently lett for more money than when it is, by a relaxation in the exertions of the tenant, become more exhausted. *Vide*, a most excellent paper on exhausting crops, and ill-drawn leases, in the Appendix to the Worcester Report, 4to. edition, page 13.

Since the former impression of this work was published, the

the Courts of Law have given such a turn to the connexion between landlords and tenants, as is calculated to reduce the means which the latter had, of committing waste with impunity; as may be understood by reading the following cases.

HEREFORD ASSIZES, 1802.

CUPPER v. WELLS.—This was an action brought by a landlord against his tenant at will, for not managing his farm in a husbandman-like manner. The damage was estimated at upwards of 300*l.*

Mr. GARROW, for the plaintiff, observed, that a very mistaken notion pervaded a great many persons, who thought that a tenant at will had a right to do what he thought proper with the lands lett to him. Of that description was the defendant, who having had notice to quit, began destroying the lands he had cultivated to his own advantage for a considerable number of years before: he ploughed up the meadows, sold the crops by auction, parted with the dung and manure from the farm, pulled the bodies of the nectarine and peach trees from the garden walls, pulled up the plants, and committed every kind of deterioration he could think of, merely from an idea, that being a tenant at will, he had a right to do, as he said before, whatever his will directed. After the case had been proved, and evidence given in defence,

Lord ELLENBOROUGH observed, that a farmer was bound to leave his farm in a similar state to that he found it in, notwithstanding he should be a tenant at will. He was also bound to manage it after the custom of the country, and in a husbandman-like way. It was no defence to say he had laid down the meadows, and consequently, when called on to quit, he had a right to break them up, particularly when a fair compensation was offered to him. There certainly was something in the cause that partook

of

of a willingness to destroy the farm, and the jury would say what the damages should be.—Verdict for the plaintiff, damages 204*l.*

Wood v. Cooke. August 1802.—This cause was tried at the Warwick assizes before a special jury, for breach of covenant in a lease. The defendant occupied a grazing farm under a lease for twelve years, at a low rent, and in the spring of the last year, applied to the plaintiff to retake the land, who told the defendant he should have it cheaper than any other person, although many had applied. The plaintiff and defendant were within 2*s.* an acre of agreeing, when the defendant told the plaintiff, if he would not lett him the land at his price, that he would mow the whole (which consisted of about 50 acres of old pasture, and 25 of meadow), and stock it so with cattle in the winter, as to make it like a fallow. From such language the plaintiff refused to continue him tenant, and the defendant made good his promise: he mowed the whole, and in the winter put nearly four times the number of cattle upon the land to what was usual, and particularly in one meadow of about five acres, kept, in the middle of winter, 22 head of cattle, and foddered them at long temporary cribs, and actually made some parts like a fallow.

The defence set up was, that the defendant was not prohibited by the lease from mowing the whole, and that he was only spending the fodder that arose from the land, and which by a covenant he was bound to do.

The learned Judge immediately told the jury, that the defendant well knew, that if he mowed the whole, he must keep a greater number of cattle than usual to consume the fodder in the winter, and by so doing, had broken a covenant, not to put upon the premises, in the last year, a greater number of cattle than according to the usual

usual course of husbandry, and directed the jury to find a verdict for the plaintiff, with the whole damage of 102*l.* 3*s.* which the plaintiff proved he had sustained. The jury returned a verdict for the plaintiff, with full damages; and the Judge said, he should certify that it was a proper cause for a special jury to try, which subjects the defendant to pay full costs.

COURT OF KING'S BENCH, NOVEMBER 13, 1802.

ELWES v. MAW.—Lord ELLENBOROUGH gave the judgment of the Court in this case, which was argued yesterday.—It was a special action on the case, in the nature of *waste*, and by the case reserved it appeared, that the defendant held a farm under the plaintiff for the term of 21 years; that within the 15 last years of the term, he erected several buildings, viz. a beast-house, a foal-yard, a carpenter's shop, &c.; that these buildings were of brick and mortar, covered with tiles, and had their foundations in the ground; that the defendant, when he went away, pulled down the buildings, dug up the foundations, and carried away the materials. It was also found that these buildings were useful and necessary in the occupation of the farm. The Court, he said, had maturely considered all the cases cited at the bar, and were of opinion, that the defendant had *not* a right to carry away buildings so constructed. The question of fixtures, as they were called, might arise in three cases. First, between the heir and executor; and here the old rule of law prevailed in all its strictness; for whatever was affixed to the freehold, was considered as a part of it, and the executor should never take it away as *personal property*, against the claim of the heir. The second class of cases might arise between the executor of tenant for life, and the remainder

man;

man; and here the rule has been somewhat relaxed; for the cases had decided that steam-engines, furnaces, vats, coppers, &c. erected for the purposes of trade, might be removed without subjecting the party to an action for waste. The third case, in which the question might arise, was between landlord and tenant: this was by far the most important, and likely to produce the greatest number of questions; and here the rule admitted of the greatest number of exceptions. The ground-work of these exceptions was the favour shown to trade, and therefore, whatever was erected for the convenience of trade, had been allowed to be removed by the tenant. Thus mills, cider-presses, furnaces, &c. &c. had all been held removable, though affixed to the freehold. It had even gone further, and allowed ornamental additions to houses to be removed, such as pier-glasses affixed to the walls, marble chimney-pieces, and even wainscots. But none of the cases had gone the length of saying, that buildings erected for the more convenient enjoyment of the profits of land, should come within the exemption from the general rule of law; that every thing affixed to the freehold should be considered as a part of it. The cases of fire-engines in coal-pits, and cider-mills, had been decided on the ground that these were trades, and the machines necessary for those trades. In a case before Lord MANSFIELD, he held salt-pans not removeable, because they were only for the more commodious enjoyment of the profits of the land. On these grounds they were of opinion that judgment should go for the plaintiff.

It may not be improper to remark, as the case is one of general concern, that the law, as recognized and settled in the above case, will be as follows: that whatever is affixed to the freehold, not merely buildings, but stoves fixed, glasses screwed to the wall, chimney-pieces, &c. cannot

cannot be taken by the executor against the heir, but will belong to the latter; that in the case of an executor of a tenant for life, against the remainder man, all machines erected for the purpose of trade may be removed, but not other fixtures, such as chimney-pieces, &c.; and that in the case between landlord and tenant, the latter may not only remove machines and erections for the purposes of trade, but also ornamental additions, such as marble chimney-pieces, &c.; but that buildings made for the more convenient enjoyment of the land, such as additional buildings to farms, shall in no case be removed, but remain for the benefit of the landlord.

SECT. VI.—EXPENSE AND PROFIT.

The *Expenses* of entering on a farm, are much greater in the counties near the metropolis than in more distant places. This is principally occasioned by the ingenuity of the referees, who make the appraisement which then takes place between the out-going and the in-coming tenant. This includes every thing in which the way-going tenant is supposed to have any interest, from the growing crops downwards, to the dressings and half dressings, the live stock, poultry in the yards, fish in the ponds, the fallows, dunghills and mixens, the implements serviceable and unserviceable, the heads of pollards, the side branches of trees, and the live bushes in the hedge-rows. These, and a hundred other articles, are enumerated and valued, which swells the account to an incredible sum, for which the in-coming tenant is debited. One would think, that in fairness, a similar valuation should be made of the dilapidations and depredations committed in the buildings

buildings and the soil, the fences, ditches, and drains, and that this sum should be taken from the former, and the balance only be paid. But this is never done. The whole has very much the appearance of being conducted as if the out-going tenant were the only person whose interest should be consulted. The other is ordered to pay, without deduction, the amount of the debt, before he can have possession, and it frequently so much exceeds his expectation and reckoning, as to be a considerable step towards his ruin.

The *Profits* of farming, under the old rotation of two crops of corn and a fallow, have seldom afforded more than a mere subsistence to the farmer, and the means of establishing his children to run the same course. But even this is no proof against the profits of farming at per cent. on the capital employed, which is generally so small a sum, that the nett produce may be a large per centage, and, with sedulous attention, this has been the fact, as the accounts of particular families have demonstrated a profit of 30 per cent. per ann. on the sum employed, for 35 years in succession. Indeed it is evident, that a man who employs only 500*l.* and with it brings up a large family, and places them in a situation equal to his own, while himself, after being in business 35 years, retires with an easy fortune, could not have done it with a less return.

The great improvements which have for some time past been taking place in agriculture, are occasioning such a rise in rents, as will put farmers of the old school to considerable difficulty, and by that means urge them to adopt the new practice.

As the expense, produce, and profits of farming, are affected by every considerable change in the state of the atmosphere, and as estimates of this kind are altogether local,

local, I shall only present my readers, in this place, with two estimates, and they shall relate to the expense of labouring cattle.

Premising that they are meant for the neighbourhood of London, and must not be expected to apply in dissimilar situations, the most that can be expected from them will be, to furnish the method of making such estimates as may suit other districts.

ESTIMATE OF THE ANNUAL EXPENSE OF LABOURING HORSES.

The horses belonging to the Royal Train of Artillery are fed in the following manner, namely,

	£.	s.	d.
10lbs. of oats per day, or a fourth part of a bushel of 40lbs. which is at the rate of 91 bushels and 1 peck per annum: suppose them to cost 3*s.* per bushel, it amounts to	13	13	9
12lbs. of the best upland meadow hay per day, that is, two loads, six trusses and a half per annum; suppose this to cost 5*l.* per load, it amounts to	10	18	0
8lbs. of wheaten straw per day, is equal to 2 trusses in 9 days, or 2 loads, 9 trusses, and 4lbs. per annum; suppose this to cost 2*l.* per load, it amounts nearly to	4	10	3
The annual expense of one of these horses, in diet and bed, is thus ascertained to be	29	2	0

The draught horses of the farmers of Middlesex are supposed to cost their owners nearly as under; namely, five horses, in one week of seven days, actually consumed half a load of hay in the stable, three trusses on the road to

to and from London, and five trusses cut into chaff, of which every heaped bushel weighed seven pounds. In this manner, the week's consumption was 26 trusses; that is, equal to seven loads and a half for each horse; or 30 loads per annum, for a team of four horses. The same five horses were allowed eight bushels of beans, split, per week; that is, equal to $83\frac{1}{4}$ bushels for each horse; or 41 quarters and 5 bushels per annum, for a team of four horses.

The straw was not taken any account of.

ESTIMATE OF CHARGES, FOR ONE TEAM OF FOUR HORSES, AT THE FOREGOING RATE OF CONSUMPTION.

	£.	s.	d.
$41\frac{5}{6}$ quarters of beans, split, at 30*s.* is	62	10	0
30 loads of hay, at 4*l.* or 20*s.* less than the market price of 5*l.* owing to the expense of marketing this hay, not being incurred, is	120	0	0
10 loads of straw, at 1*l.* owing to a similar saving of the market expenses, where it might have been sold at 2*l.* is	10	0	0
The diet and bed, of four of these horses, cost about	192	10	0
That is for each horse at the rate of	48	2	6
To which add, for shoeing one horse, ...	2	0	0
Farrier, for each horse, ...	1	0	0
Decline in value, and interest of his first cost,	4	0	0
Accidents for each horse, ...	1	10	0
Harness, ditto, ...	2	[illegible]	0
Tax on farmers' horses, ...	0	12	6
Allow for the annual expense of keeping up the stock of carts, waggons, ploughs, harrows, roll, and other things, at per horse,	4	5	0
And the whole annual expense of one of these horses, is about	£.63	10	0

That

That is, at the rate of 254*l.* for a team of four horses; to which, if we add for wages of the man who has the labour of feeding, cleansing, and driving them, 15*s.* per week, or for one year, 39*l.*; for porter, 5*l.*; and toll-gates, a cart 5*l.* or a waggon 10*l.* which is not more than they cost; we shall find, that such a team, employed two-thirds of its time on the roads between a farm and the markets, eight or nine miles off, cost their master, annually, from 303*l.* to 308*l.*

The quantity of hay said to be consumed by the horses in this estimate, has the appearance of being immoderate; but the horses were supplied from hay weighed and trussed in half hundreds; and the servants who made the experiment, by order of their master, reported to him, that the consumption accorded with the foregoing statement.

By this account it appears, that these horses, kept on dry food all the year, cost their owners 48*l.* 2*s.* 6*d.* But farmers' horses are mostly, and may always be, kept from thirteen to sixteen weeks in summer, on green meat, such as rye, tares, clover, or grass, which is less expensive than hay, by the cost of converting such things into hay; it likewise prevents the risk of losing or spoiling hay in a wet season. These advantages are equivalent to 20*s.* per load; and as one horse consumes in that time about two loads of hay, the whole of such saving amounts annually to 2*l.* per horse. Such a small sum per horse, is equal to 8*l.* per annum, for a team of four horses, or 6*d.* for every working day. Every carter is allowed porter, one pot (quart) daily, when he is on the roads; but at plough, he is stinted to less than small beer; the difference is 5*d.*, together 11*d.* which is just sufficient to pay the wages of the boy who drives the plough; therefore the expense of such a team is 1*l.* per day on the farm, as well as on the

roads. As many of the teams of four horses, in this and other counties, are constantly attended by a boy as well as a man, I think the expense of the former, on an average of the county, is a sufficient set-off against any saving which can be made by the use of green food. Again, many of the men who drive hay-carts into London, have lately been indulged with a poney for their own use, which prevents their riding on the shafts of the cart, where they would injure, at least, one of the draught horses. The first cost and maintenance of the poney is not included in the foregoing estimate; consequently, such a team must cost more than 20*s.* per day; but, on the contrary, when the horses are idle in the stable, the expense of porter, toll-gates, and wear and tear, will reduce it to a trifle below 20*s.* On the whole, I think I am warranted in drawing this conclusion, that the expense of such a team averages about 1*l.* for every day on which it ought to be at work.

The expense of 20*s.* per day will be incurred, whether the team be on the road, or at plough, or idle in the stable; which demonstrates the necessity of the horses being employed daily, and of their being made to perform a full day's work. It is also obvious, that it will require all the attention which the farmer can give to these matters, to keep the expense of his labouring cattle so much down, as to render it supportable; and that the maintenance of such costly teams, by husbandmen, must powerfully repress the rent of land.

The expense and produce of crops, may be found in the Sections to which they belong.

Farming, like all other things, affords a living profit for the average run of men; persons whose minds are below mediocrity, barely obtain an existence; while others, who possess superior intelligence and energy, will, in all times,

times, be able to acquire a fortune: Providence seems to have wisely ordained, that such shall be the result of all the labours of man.

CHAP. V.

IMPLEMENTS.

THE *Plough* in general use throughout this county, is a swing one of the most clumsy construction. Its weight is more than one horse can draw in constant work, and its shape is very ill calculated for the ploughing of any soil, as it *tears* its way through the ground, instead of *cutting* it: a massive beam, with an horizontal bend (to give the plough land which sets the share in a direction contrary to the line of draught, and consequently increases the resistance), a barbarous shape, which, united to an awkward copps, makes it impossible to use it with horses drawing double. Its useless weight, and worthless shape, is a disadvantage of the draught of two horses.

The Hertfordshire wheel-plough is used on part of the north border of the county, drawn by four horses, yoked in pairs, or sometimes by three horses; two yoked together next the plough, and the other before.

Harrows of four bulls each (not straight, but bent bulls). Three of them generally are chained together, and dragged

by three horses a-breast, with a man to lead or drive the horses, and frequently another to attend the harrow, going at a pace as slow as the animals can possibly move. In some instances, I have seen two horses at length, led by two young men; sometimes driven by one, and the harrows attended by the other. But in cases where the land is too wet to bear treading without injury, three or four harrows are chained together (no other coupling being used) to cover one ridge at a time, each attached to a pole, whose length is equal to the width of one ridge. Two horses are then yoked to each end of the pole, and walk in the furrows. By this contrivance, the land is harrowed, and the horses kept from treading on the ridges.

Two descriptions of rollers are in use. The *barley roll* is always made of oak, about 12 inches diameter, generally drawn by shafts, and by two horses at length. With this roll, all the land sown with spring corn is gone over a day or two after sowing, by some farmers; and by others, after the blade of the corn is out of the ground. The *grass roller* is also generally made of oak, about 30 inches diameter, always with a pair of stout shafts, and usually drawn by three horses at length. In some gentlemen's grounds, *iron rollers* are used in the same manner; and in those of others, *wooden rollers*, made of four or five feet diameter, by nailing stout oak plank round the rims of three carriage wheels. Over this latter roller is sometimes placed a box, resembling a cart, for the purpose of loading the roller with stones, to add to the weight.

There are but few waggons employed. *Six-inch wheeled shooting-carts*, with wooden axletrees and iron arms, are in very general use, which hold, in the body of the cart, from 50 to 60 cubical feet; with the side-boards on, about 15 feet more, and when heaped with dung, about 20 feet in the heap. Thus heaped, they carry about 90 feet of dung

ding with four horses, or from 70 to 75 with three horses. These carts, with the addition of moveable head, tail, and side ladders, carry hay, corn, and straw.

Ploughing, like every other operation in tillage, will always be various, as no plough has yet been, nor probably ever will be, constructed, superior to all others in every season, and on every variety of soil and shape of surface. A soil suitable for turnips and barley, may be well tilled by almost any plough. The principal excellence in a plough for this soil, consists in its being of light weight and easy draught, and also in its being competent to leaving the surface in any required shape, from a ridge of less than thirty inches, to one of upwards of thirty feet.

The light swing-plough in general use throughout the North of England and South of Scotland, and likewise some of the neatest of those in Suffolk, as much exceed the ploughs now made in this county, as coachmakers' work does that of a common wheelwright. They ought to be considered as working models of their kind, for the ploughmakers of the rest of England.

There is not an arable close in this county, but what might be tilled by either of these ploughs, with two horses*, without a driver; a very few flinty loamy clays excepted, and which are bordering on Hertfordshire.

Wheels seem to have been added, for the purpose of assisting bad ploughmen in free soils, and all sorts of ploughmen in stony, stubborn soils. They are, in general, expensive, cumbersome, and unsightly, and are resorted to where the ploughman cannot otherwise be de-

* Even the two worst horses in most of the teams in this county, might be made to plough six acres in six days, with ease.—*J. M.*

pended on for regularity of depth, and neatness of work. Bad ploughmen very generally rest a part of their weight on the handles of the plough, which must necessarily have a counter balance, and that is usually obtained by giving the point of the share too great a dip, and in a direction contrary to the line of draught: thus, the weight which the man rests on the plough is more than doubled, which increases very considerably the labour of the horses. In order to remove this inconvenience, the Suffolk and Norfolk farmers cause their ploughs to be made with one handle only, which soon tires the hand of the man who presses on it, and obliges him to walk upright, and carry his own weight.

In every county there are some superior ploughmen, who can regulate the coulter and share so correctly for executing good work, that with any plough they carry their own weight. It is a fact, that the swing-plough of every district, when held by a good ploughman, is drawn by less power than would be requisite to draw a plough of the same construction with wheels; it also costs less money, and is repaired at less expense. The disadvantage which the latter labours under, is occasioned by the weight of the carriage and wheels, and also by the share having too much declination.

Wheel-ploughs happen to do their work with less trouble to unskilful men than the swing ploughs, for which reason they discourage the use of every other sort, by putting on a sour ill-conditioned temper, when any attempt is made to introduce swing-ploughs where they have been accustomed to use those with wheels.

Premiums to the best ploughmen, repeated annually and certainly, are well calculated to excite emulation among these men, and thereby do much towards obtaining perfect tillage.

Or

On a comparative view of the whole of any two extensive districts, whereof one is tilled with wheel-ploughs, and the other by swing ones, as Berkshire and Norfolk against Middlesex and Surrey, including every description of ploughmen usually met with in those counties, it has appeared to me on many occasions, that for neatness of work, wheel-ploughs have the advantage. This circumstance, and keeping the men in good temper, is probably of more consequence than a little disparagement in point of draught.

The light swing-plough is ably treated of by Mr. BAILEY, of Northumberland, and it is, in many cases, a very superior implement; but, like every thing of human invention, it has its defects, and is wholly incompetent to the ploughing any tenacious soil that abounds with stones. There is much strong land in most districts, both with and without stones, which becomes so very hard in summer, as to be impenetrable to such a plough, and incapable of being well and neatly tilled by any swing-plough.

When a tenacious stony soil is baked by the sun in a hot summer, and its moisture evaporated and carried off by drying winds, it can only be tilled by a powerful wheel-plough; for which purpose, the *Hertfordshire* wheel-plough (I believe principally from the circumstance of its having a picked share) is superior to any other plough with which I am acquainted. Next to that, the *Kentish turn-wrest* plough, with a chisel-pointed share, is justly esteemed a very good implement; and for very deep ploughing, it probably may be entitled to the preference.

Sir JOHN SINCLAIR well observes, that "a wheel-plough can tear up hard land in summer, much better than a swing-plough. Another advantage is, that the wheels may be placed in such a manner, as to confine the plough

accurately to the width of the intended furrows. Such a plough keeps a more regular depth, and is capable of turning a shallower furrow; which qualities are useful when seed corn is to be ploughed in, and they are of consequence where the drill system is followed.

There are cases successively happening on every arable farm, which create a wish in the farmer to turn a few furrows more in one direction than the contrary—frequently near a road or foot-path, but more generally near hedge-rows; so as to turn the soil from them, and to plough head-lands wholly from the hedge, and in many cases of laying arable land to grass. Every man who is attentive to his concerns, would, under such circumstances, discover the superior utility of a turn-wrest.

There is also a wheel-plough, though rather of a heavy construction, in general use near Reading and Newbury, in Berkshire, with which the men of that county work neatly and well.

The *double plough* is liable to the objections which I have stated against the light swing-plough, together with the additional objection, that if it were to be constructed for a strong soil in a dry and stony state, it would require eight or ten horses to draw it, by which it would be strained, and rendered unfit for use. No person in the country could repair it: this might occasion its being sent one hundred miles to the person who made it, probably in London, where it would remain under cure a fortnight, and then be returned into the country. After a month's absence, and three guineas expended on it, the plough would be fit for work again: the owner of it would be fortunate, if it performed another month's work before it became equally useless as before. But in the moist climate of the West of England, or in Ireland, these inconveniences will not be so often experienced as

they

they would be in other places. Probably, for the purpose of ploughing a level close of a sandy soil into wide ridges, it may be either a first or second best. It is, however, evidently more confined* in its operations than any single plough; but as it saves the expense of one person, in respect to attendance, there are some, though few, occasions when it would be an acquisition.

Another implement, applicable to a light or sandy soil, is "a share of two feet in width, to fix on a common wheel-plough stripped of its mould-board, which is excellent in the labour-saving way, by cutting a pea, tare, bean, or other stubble, at about two inches below the surface. Not turning any furrow, it leaves the weeds and roots all cut through, fit for being immediately harrowed out, raked into heaps, and burnt."—*Arthur Young.*

Deep soils of every texture are peculiarly adapted to the use of the *trench-plough*, or of being ploughed two or more slices deep. The first cuts off the weeds, and deposits them at a considerable depth; the next raises a slice of clean mould from below the soil which produced the last crop, fresh and full of heart, which it lays upon the vegetable rubbish turned down by the former, in such a thickness as to smother the weeds, and decompose them into nurture for the next crop. This operation will in every soil require a strong team, but one such ploughing is all that any land ought to receive, and it is sufficient for almost any crop. The slices being laid one over another, the land will generally harrow well; and when it is considered how many ploughings are now given, pre-

* It will frequently be necessary to have a single plough, to finish the furrows between one ridge and another, after the double plough.—*J. M.*

paratory

paratory to a crop of turnips or barley, and, by the fallowists, for wheat; and also how much labour in the latter case is bestowed, in the raking, picking, and burning of weeds; and also what a great expense these operations occasion to the farmer, it will immediately occur, that if these disadvantages can be removed by one trench-ploughing, the result must be very greatly in favour of that method. In strong land, it keeps the surface more free from excess of moisture, and in every soil it has a considerable tendency to preserve the land from the destructive effects of exhausting crops. Another advantage of high importance is, that under the system of trench-ploughing, the staple of the soil is increased in depth, its parts are divided and loosened, which gives the roots of the crop room for the utmost range of their feeding powers, and consequently, cannot fail of producing crops that will be proportionably greater by this, than any other method of ploughing. Kitchen-gardeners and nurserymen are so well aware of the advantages of this, that they never think their land in a good state to bear crops of any kind till it has been trenched.

A greater number of coulters than one, in any plough, do harm, by cutting the slices narrow, and in a perpendicular direction, so as to occasion their being laid on their edges. Trench-ploughing, on the contrary, turns them completely upside down. The former method places the weeds within the influence of the atmosphere, where they will certainly flourish; the latter smothers and destroys them*.

---

* Mr. Arthur Young informs us, that Lord Winchilsea finds great advantage from occasionally trench-ploughing a fertile sandy soil.—*Annals of Agriculture*, vol. xxxii. p. 359.

In

In this county, *harrowing* is a tedious business. The pace of the horses is disgusting; the harrows so often hitch one on to the other, that the man is obliged to stop a fourth part of his time to set them to rights. This might be prevented by placing a board of six or more inches wide, edgeways upon the right-hand bull of each harrow, or what perhaps is better, by coupling them together with hooks and eyes, and by driving the horses with whip-reins of sufficient length to admit the man to walk after the harrows (as is the case on the borders of England and Scotland, and in Norfolk and Suffolk). They would, as a necessary consequence, harrow four times as much land in a given time as by the present method, and it would be done much better.

The *rollers* being usually drawn by horses at length, treading after each other, must necessarily make a horse-track, which is very injurious to the ensuing crops. Likewise the earth which is occasionally scraped off the rollers, smothers every thing where it happens to fall, and there is a loss of time in such scraping. All these inconveniences are remedied in a roller which I have used for some years, with double shafts and a scraper. Those persons are mistaken, who have their heavy roller made of large diameter, as that very circumstance diminishes its pressure, by reason of its bearing on too much surface at once. It is evident that small rollers, loaded to the same weight, must have a greater effect.

I do not know of any instance of Mr. DUCKET's simple, cheap, and effectual *drill* being used in this county, although it was first made, and is now much used on the Surrey side of the Thames. It opens the ground readily, and in equidistant rows, removing the mould in as light a manner as can be done by hand-hoes. This is more eligible than the *fluted roller*, on any soil that is not too light

light for the intended crop; but on sand, in a dry or dusty state, the latter may possibly be entitled to the preference.

The *carts* now in general use in this county, are more clumsy and heavy in their construction, made more faultily, and of worse materials, than any I have observed in any other part of England. Even when empty, they are considerably heavier than one horse can draw in constant work, which difficulty is greatly increased by the breadth of the wheels, as they must necessarily pass over every thing that lies in their way; whereas narrow wheels pass by every *small* obstruction, and more easily divide the dust in summer and the mud in winter. This is one of the great advantages that all light carriages possess.

The *single-horse carts* that are in use in various parts of England, appear to be the best calculated for the purpose of carrying all kinds of goods, except indeed in single trees, blocks of stone, or any other article whose weight may be too much for the strength of such carts, and which cannot easily, and without loss, be divided into separate loads. In all, or most places, where the roads are particularly bad, either arising from soft mud and clay, or large stones, and where there are deep ruts, especially in hilly countries, and where the people are poor, and consequently particularly studious to keep their expenses under as much as possible—these are the places*, and the people, with whom single-horse carts are in common use, and is a proof of the economy of the plan. It is equally certain, that where the country is level, the roads free from ruts, and the people rich, they indulge in expensive horses, and in teams of parade and show. Such, for instance,

* Viz. in the mountainous districts of Derbyshire, Wales, Cumberland, Dumfries, Dumbarton, and various other parts.—*J. M.*

stance, as those used by the brewers and distillers of this county and Surrey. The economy of single-horse carts is so clearly made out in the Cumberland Report, that I need not enlarge on their utility to a Middlesex farmer, further than to request his attention to what is said on that subject in the said Report.

It is becoming daily more and more necessary for every arable farm to have a *thrashing-mill*. It is the only method left, for having the corn cleanly and properly separated from the straw. The men in the southern counties are too lazy to thrash clean, and too much given to pilfering, to be trusted alone among the corn. In Middlesex, employ them by the day, and they will not do half a day's work, neither will it be done clean; and set them to work by the quarter, or the truss, and they will disjoin the freest corn and leave the rest in the ear. This may seem severe, but I speak from experience at home, as well as from observation and the complaints of farmers, elsewhere.

Mills are very desirable, as they not only sever the corn from the straw, but may be made to winnow at the same time; and are so quick in the work, that it may all be done under the eye of the master, and the corn secured in the granary without the least pilfering. The saving by this means of thrashing, in the extra quantity of corn procured, and the security against having the corn stolen in the chaff, amounts to an advantage in favour of the mills, of about ten per cent. on the corn crops; in some cases, to one shilling a bushel on wheat, and very generally to twenty shillings an acre on the wheat crop.

The expense of thrashing wheat, in this county, by the flail, is full four shillings per quarter. Supposing the land to produce twenty-four bushels, the thrashing is twelve shillings per acre: to this add eight shillings for thin wheat

left

Another person says, "The best manufacturer of agricultural implements who has ever yet tried the task in Great Britain, was a Mr. SMALL, of Berwickshire, who was patronized by the late Lord KAIMES, in making a plough of peculiar construction, which has since obtained general preference. The manufacture which he established, still subsists. The ploughs and other implements which it furnishes, are, in all respects, for the purposes of husbandry, the best in Britain."

CHAP. VI.

COMMONS, ENCLOSING, &c.

SECT. I.—COMMONS.

IN the early ages of the world, all the land was in common, or was every where depastured by the cattle and animals of the community: the first enclosures were of necessity, so many encroachments made by individual persons from the land which laid in common. These encroachments have been continually increasing in number, which could not take place without producing a proportionate diminution in the quantity of common land. Such was the only kind of enclosure known in the early ages; and until the people began to think favourably of it, which in this country encouraged the first application to the Legislature, for authority to enclose the land which remained open in a whole township. This succeeded, and every large

large enclosure has now long been made under similar authority; which happily has extended so far, as to reduce the common land in Britain to much less in quantity than the enclosed. At this time the inhabitants of Britain are so fully convinced of the superior advantages which enclosed land has over such as is common, that one general desire prevails, and that is, to enclose and cultivate the whole. The arrival of such a time of general prosperity, and greatly increased population, we now know, is only delayed by the perverseness of some lords of manors and tithe-owners.

The remaining Commons of Middlesex are situate, as might be expected, in the more remote parts of the county, and bear a much smaller proportion to the whole quantity of land, than those of most other districts in the kingdom.

The names, and computed quantities, are as follows, viz.

1. Hounslow-heath,	5000	acres.
2. Ashford-common,	250	
3. Littleton-common,	250	
4. Laleham-common,	200	
5. Stains-moor,	300	
6. Cowley-moor,	150	
7. Hillingdon-heath,	150	
8. Uxbridge-common,	350	
9. Harefield-common,	200	
10. Finchley-common, on the authority of ROCQUE,	1243	
11. Clapton-marshes,	400	
12. Hadley, an allotment from Enfield-chase,	190	
Together amounting to	8683	acres*.

* The foregoing quantities are collected from a map, and are of course very erroneous; but they will serve to give a general idea of the extent of the Commons.—*J. M.*

To which add, for several smaller ones of under 100 acres each, such as Hampstead-heath, Ealing-common, Uxbridge-moor, Memsey-moor, Gould's-green, Peil's-heath, Hanwell-common, Wormwood-shrubs, and others, which possibly may contain altogether 500 acres: then deduct for roads, ponds, and gravel-pits, nearly the same quantity, and it will show that the uncultivated soil of this county, capable of receiving improvement, is about 8700 acres, or one-twentieth part of the whole quantity.

Hounslow-Heath,—according to ROCQUE's map, which was published in 1754, contained 6658 acres; since which time, it has been reduced by many small enclosures, which have been made by encroachment. In 1789, about 350 acres of it, which belonged to the parish of Stanwell, was enclosed by Act of Parliament; and about the year 1802, such parts of this heath as laid in the parishes of Teddington, Hanworth, and Feltham, amounting to 1200 or 1400 acres, were likewise brought into cultivation: which several enclosures have reduced the extent of the heath to about 5000 acres. The enclosures which have recently taken place in the adjoining parishes, will be exceedingly profitable to the owners of the land; therefore it is hoped, and much to be wished, that their success may induce all the persons who have any interest in this extensive waste, to take such measures, without delay, as may be necessary, to bring the whole of it under the dominion of the plough. Hounslow-heath is land of such good quality, that it is disgraceful to the county, and insulting to the inhabitants of the metropolis, that it should remain in its present unproductive state, when it might be brought to yield an average produce of 10*l.* per acre, per annum.

Finchley

Finchley-Common.—The soil of two-thirds of this common is a strong loam, of ten or more feet in depth, very wet, and much poached by cattle. The east side, containing about one-third of the whole, is dry land, and nearly covered with furze. The wet part requires only surface-draining, to render it good sound pasture. On this common there are several thousand pollards, of hornbeam and oak, which never can produce a shilling to the Lord of the Manor, so long as they are permitted to occupy their present situation. Their numbers must annually decrease, as no new ones are permitted to rise, and I observed that several had lately been grubbed up. By taking the whole down at once, the proprietor might unquestionably put several hundred pounds into his pocket. This Common carries a large stock, principally of sheep, through the spring, until the hay is made on the adjoining farms, when they are received into the enclosures; for which purpose it is of some use to the neighbouring farmers. There are appearances of marl in various places; and from Muswell-hill, the south-east corner of this common, there is a beautiful prospect over Hornsey, Clapton, London, and the river Thames. There are many points in this situation, that as much deserve to be adorned with elegant villas as any other spot in this highly-favoured county.

The Moors between Stains and Longford—are, for the most part, on a gravelly bottom, but so often flooded and chilled by water, and so much injured by the poaching of cattle during the winter, that they produce but little herbage till the latter end of May. The greatest improvement that could be made on these pastures, would be effected by division, and converting the whole into water-meadow.

The Commons in Middlesex, as in most other places, are three-fourths of them covered with heath and furze*, from which a little of the worst sort of firing is obtained by the poor. The trifling quantity which cattle consume from these shrubs, does not improve them, as it is barely sufficient to keep them from starving. Much of the remainder is occupied by roads, gravel-pits, and ponds, yielding nothing. I am inclined to think, that about 3000 acres of the commons in this county, are employed in the production of grass for the feeding of cattle, affording a miserable pasture, as a considerable part of it is under water during winter. And as most of it is poached and trodden down by cattle while wet, it is rendered hard, lumpy, and full of holes, which makes it partake of the sterility of mortar during summer. The grasses are mostly of the dwarf kind, and of scanty produce, with a larger proportion of such grasses as are known to be more dangerous than nourishing: so much so as to induce *some of the most observing farmers*, in various parts of the kingdom, possessing extensive common-rights, after a fair trial, to refrain altogether from turning their cattle on such commons. *On such authority it may well be questioned, whether commons are of any more use to the community, than they would be were they consigned to the bottom of the deep.* Without attempting the solution of such a question at present, permit me to observe, that the value of commons, considered

* There is a large quantity of land in Great Britain, producing heath, furze, and bents, all in a dwarf state, which would be very much improved by the proper application of lime alone, as it would gradually destroy those worthless plants, and in lieu thereof, produce a fine sheep pasture, without ploughing, or any other expense. In all situations where the superstratum is thin, on a subsoil of gravel or coarse sand, and usually denominated burning, the same good effects would result from the use of marl, without ploughing.—*J. M.*

solely

solely as to their power of increasing animal food, and as totally unconnected with the adjoining enclosures, is exceedingly small indeed. But when considered as affording an opportunity to the neighbouring farmer to turn his stock out, in the spring quarter of the year, the farmer is thereby enabled to mow all his enclosed grass-land; and consequently, increase the quantity of hay to be sent to market, as at Finchley, and Harrow-weald, in this county; or being applied, during the winter months, to the support of a greater quantity of live stock, in places more distant from a good hay-market; and in others, for the purpose of folding on the arable land.

On estimating the value of the Commons in this county, including every advantage that can be derived from them, in pasturage, locality of situation, and the barbarous custom of turbary, it appears, that *they do not produce to the community, in their present state, more than four shillings per acre!* On the other hand, they are, in many instances, of real injury to the public; by holding out a lure to the poor man—I mean of materials wherewith to build his cottage, and ground to erect it upon; together with firing, and the run of his poultry and pigs for nothing. This is, of course, temptation sufficient to induce a great number of poor persons to settle on the borders of such commons. But the mischief does not end here; for having gained these trifling advantages, through the neglect or connivance of the Lord of the Manor, it unfortunately gives their minds an improper bias, and inculcates a desire to live, from that time forward, with little labour. The animals kept by this description of persons, it is soon discovered by their owners, are not likely to afford them much revenue, without better feed than the scanty herbage of a common; hence they are tempted to pilfer

corn, hay, and roots, towards their support; and as they are still dependent on such a deceptious supply, to answer the demands of their consumption, they are in some measure constrained to resort to various dishonest means, to make up the deficiency.

Another very serious evil which the public suffers from commons, is, that they are the constant rendezvous of gypseys, strollers, and other loose persons, living under tents which they carry with them from place to place. Most of these persons have asses, many of them horses, nay, some of them have even covered carts, which answer the double purpose of a caravan for concealing and carrying off the property they have stolen, and also of a house for sleeping in at night. They usually stay two or three nights at a place; and the cattle which they keep, serve to transport their few articles of furniture from one common to another. These, during the stay of their owners, are turned adrift to procure what food they can find in the neighbourhood of their tents, and the deficiency is made up from the adjacent hay-stacks, barns, and granaries. They are not known to buy any hay or corn, and yet their cattle are supplied with these articles, of good quality. The women and children beg and pilfer, and the men commit greater acts of dishonesty: *in short, the Commons of this county are well known to be the constant resort of footpads and highwaymen, and are literally and proverbially a public nuisance.* And that they are so in the more distant counties, see the Gloucester Report, page 50, and that of Hereford, page 28. Additional injuries which commons render to society, are noticed in several other parts of this Work.

That the Commons of Middlesex are capable of being improved, so as to produce large crops of all the vegetables usually

usually cultivated, and to rear and support a very highly improved breed of cattle, there can be no sort of doubt*. And although one moiety of them have been enclosed since the first publication of this Work, there still remains 8700 acres of good land lying waste, which is capable of yielding annually 100,000*l.* sterling to the wealth of the county.

It is truly lamentable to see in every part of these kingdoms, such extensive tracts of land lying uncultivated; producing no revenue to the owners of such property, and it is extremely doubtful if it yields any benefit to the community. Surely it is disgraceful to a nation which is flattered with being enlightened, to be so far from raising a sufficient supply of bread for its inhabitants, as to be under the necessity of importing corn from every quarter of the world (Europe, Asia, Africa, and America), while,

* "While in a state of common, every one turns on what he pleases, and there is generally double the quantity of stock that there ought to be; consequently they barely exist. Should an enlightened breeder wish to improve his sheep, he cannot do it, owing to his ewes mixing with his neighbour's flocks. If he had the best tup in the kingdom, can he be sure that one of his ewes were tupped by him, while there are probably a score of his neighbour's to contest the female with him?—On the other hand, if the common were enclosed, every one would stint with that species of stock for which his allotment was best adapted, and in such numbers as would ensure profit. When he can confine his ewes within his own enclosures, he can make whatever experiment he pleases, by putting a few, or many, ewes to any particular tup, without any fear or apprehension of having a spurious breed, by the interference of his neighbour's. He is also enabled to keep his flock from many disorders. Few commons but what have some tracts of land liable to the rot: how are they to be prevented from depasturing upon it? or if the scab, or other infectious disorders, have taken place amongst any flock upon the common, how is he to avoid it?"—*Cumberland*, page 33.

at the same time, it has *so many acres of good land lying waste, and locked up from the operation of the plough. By the single means of enclosure, an abundant quantity of corn might be produced, and many millions a year added to the wealth of Great Britain, which is now absolutely lost to society, with as careless an indifference as if the proprietors of the soil were afraid of becoming too rich;* or, as if, like the dog in the manger, they would not permit the community to share in a blessing of which themselves are not inclined to partake. But as it is very unreasonable that the nation should suffer from the obstinacy of persons of this cast, or disposition, who will neither cultivate the soil themselves, nor suffer others to do it at a fair rent; a popular, and I think effectual, remedy would be, to tax all such persons as have a right of common, and withhold their consent to a general enclosure. The amount of the tax, and the manner of levying it on the persons who have a right of common, might be easily adjusted.

The sensible people of Japan have no commons, and if any portion of land be left uncultivated, it may be taken possession of by a more industrious neighbour. Were a similar law to be enacted in Britain, it would be the means of immediately bringing into cultivation every acre of waste land in the nation.

ENCLOSING.

The following statement will show the progress which has been made towards enclosing the Commons in this county within the last five years, namely:

	Commons. Pasture. Acres.	Common Fields. Arable. Acres.	Meadow. Acres.	Summary. Acres.
Enfield,	1532	2747	794	5073
Edmonton,	1231	1127	425	2783
Feltham,	728	647	—	1375
Hanworth,	460	313	—	773
Ryslip,	1371	2234	—	3605
Sunbury,	771	788	—	1559
Teddington,	453	386	—	839
Harrow-weald, 695; Sudbury, 250; Pinner, 249; Roxeth-green, 59; Wembley-green, 56; Greenhill-green, 3; Alperton-green, 6; Vicar's-green, 4; Preston-green, 7; Kenton-green, 9; Forty-green, 7; Waste in green lanes, 4	1349	3278	19	4646
The whole quantity is	7895	11,520	1238	20,653

The foregoing quantities of land were extracted from very friendly communications made to the Author by Dr. WILKINSON, Mr. THOMAS BAINBRIDGE, Mr. JOHN RICHARDSON, and Mr. JOHN TRUMPER. One or other of the three latter gentlemen were Commissioners on each of

of the said Enclosures; and the Doctor is known for the great merit of his writings on agricultural subjects.

It would perhaps be too much for me to claim, that, publishing my View of Middlesex has been productive of so much good in one county; but as little had been done in that way for ages before, and nothing of the kind was then in contemplation, it may be presumed, that this Work contributed towards convincing the owners of common-rights, that enclosure would greatly increase their property. This put them in motion, and the result has been such as ought to be the case every where, the bringing into cultivation more than a moiety of all the Commons in the county. A proper degree of liberality on the parts of the lords of manors, and tithe-owners, might extend a similar spirit of enclosure to every corner of the kingdom. It seldom wants more than a union of these two interests, to obtain the necessary number of consents to a petition for leave to introduce a bill of enclosure; therefore, if they would earnestly promote enclosure, they should take the lead, and canvas for consents in every parish and manor, in which case they would mostly succeed.

The benefits and advantages that would be derived from a general enclosure of commons, are so numerous, as far to exceed my powers of description or computation. The opportunity it would afford, of separating dry ground from wet, of well draining the latter, and liming the rotten parts, is of vast consequence; as such an arrangement would, with the aid of intelligent breeders, be the means of raising a breed of sheep and neat cattle, far superior to the present race of *half starved animals* now seen in such situations. It would have the effect of supporting a more numerous stock, on the same quantity of food, by restraining the cattle and sheep from a rambling disposition,

disposition, which not only treads the grass off the ground, but wastes the flesh off their bones. Further, the live stock would by this means be rendered much more valuable to individuals and the community, than it has hitherto been, or can possibly be, without enclosure; and, what is of great importance, it would tend to preserve such improved breed from that destructive malady, the rot, which makes such terrible havock among our flocks.

It does not appear to be necessary to state with precision (nor indeed is it capable of being so stated), what would be the increase in value, of the Commons of this county, on their being enclosed, and well and properly cultivated. *It may, however, with safety be stated at upwards of fifteen times their present value to the proprietors*, and forty times their present value to the public*†. But increasing the rental of such land to fifteen, or perhaps twenty times its present amount, is by no means the greatest advantage that may be expected to result from an enclosure of commons. *The general salubrity and healthiness of the country would be improved*‡; *while industry would be largely increased, among the*

* The present produce being only four shillings an acre, the rent cannot be stated at more than two shillings; and fifteen times that sum, is but thirty shillings an acre; which is certainly less than they would lett for after being enclosed.—*J. M.*

† The present produce, as before stated, being four shillings an acre, forty times that sum, is only eight pounds; which is not more than this land, after being enclosed, and cultivated, would produce.—*J. M.*

‡ 'I have to observe (says Mr. BILLINGSLEY, speaking of enclosure), with heartfelt satisfaction, its happy effects on the health and comfort of the inhabitants of the adjacent villages. Agues and low fevers, from the humidity of the air, impregnated with exhalations from the stagnant contents of the marshes, prevailed very generally during the vernal and autumnal seasons. And these, for the most part, were obstinate, and more frequently subdued by the drought and heat of summer, and frosts of winter,

the most useful classes of society; beggary and robbery much lessened; and the general stock of corn and cattle almost inconceivably augmented. And wherever enclosures are made with due attention to the interests of the poor (as they ought always to be), they will be found to ameliorate their condition, as much as they increase the property and the comforts of the rich*.

A proper clause in most acts of parliament, for enclosing waste land, would be an order on the Commissioners to allot a few acres of land to the minister, churchwardens, and overseers of the poor, in trust, to let the same at a fair valuation, and apply the rent of it towards providing coal for the industrious poor.

The Commons of this kingdom being, with very few exceptions, without ridges, furrows, or drains, have not the means of discharging that superfluous water from the surface of them, which is well known to be of great detriment to vegetation in general. Many commons in low situations, and where the soil happens to be of a retentive

---

water, than by the most judicious medical treatment. Enclosing and draining have rendered these diseases as scarce in the low as in the uplands. To the prevention whereof, advance of wages (from four to sixpence per day), with constant employ, arising from the same cause, have not a little contributed, by enabling the poor to live better, which is generally accompanied by a growing taste for cleanliness.'—*Billingsley's Somerset.*

* Here I am again happy to have my assertions corroborated by Mr BILLINGSLEY, in his valuable Report of Somersetshire. He says, 'I can truly declare, that in all cases which have fallen under my observation, enclosures have ameliorated their (the poor) condition, exciting a spirit of activity and industry, whereby habits of sloth have been, by degrees, overcome; and supineness and inactivity have been exchanged for vigour and exertion. No stronger proof can be given of this, than the general reduction of the poor-rates in all those parishes wherein such enclosure has taken place.'—Vide *Billingsley's Somerset*, p. 35, and sect. 3, chap. III. on Cottages, in this Work.

quality,

quality, hold water like a sponge, which being always stagnant, as well as excessive in quantity, renders the soil of such commons much too wet for the pasturage of sheep, and is the cause of many of the disorders to which that animal is subject, particularly that fatal malady the rot. From the same causes also, the neighbourhood of such common must be particularly unfriendly to the health and longevity of man. Only let us reverse the scene, and for a moment suppose the commons to be enclosed, the requisite number of ditches and drains sunk, the land brought into tillage, and we shall see the superabundant moisture got rid of; and the water, being kept in constant motion, by trickling down the side of the ridges into the furrows, and from thence, into the ditches and rivulets, will be found to *fertilize* the very soil which, in its present stagnant state, it serves to *injure:* while, by leaving the land dry, it will be rendered more healthy both for men and cattle. The effects of such a measure would soon show themselves in many districts of this island, which, at present, are very unpropitious to the health of man, in the much greater longevity of the inhabitants.

It may farther be observed, that Commons are entirely defective in the great article of labour; but no sooner does an enclosure take place, than the scene is agreeably changed from a dreary waste, to the more pleasing one, of the same spot appearing all animation, activity and bustle. Every man, capable of performing such operations, is furnished with plenty of employment, in sinking ditches and drains, in making banks and hedges, and in planting quicks and trees. Nor are the wheelwright, carpenter, smith, and other rural artificers, under the necessity of being idle spectators of the scene, since abundance of work will be found for them, in the erection of farm-houses, and the necessary appendages thereto; and in the forming and

Every thing that has a tendency to make a nation more healthy, and productive, must of necessity operate as a stimulus to population. The certainty of a man's being able, with ease and comfort, to provide for himself and family, by the increase of rural labour, is at once an inducement to marriage, and a consequent increase of population. If an increase of population is our strength, it follows, that not only enclosures should be encouraged, as having that effect, but also that every other means should be resorted to, for the purpose of preserving the lives of the people.

Cultivating the arts of peace might save annually the lives of 20,000 men; and a general adoption of the vaccine inoculation would preserve the people from the small-pox, and in that manner save 40,000 persons annually, who have usually died of that disorder. But as no invention, or contrivance, can enable us to support more human beings than are equal to the consumption of the provision that shall at any time be raised or provided for their support, so, unless improvements in agriculture, and the cultivation of our commons, are made to keep pace with the life-saving schemes, the parties will be saved from gunshot and the small-pox, to die of complaints brought on by insufficiency of food.

There are not more than 36 million* acres in South Britain employed in such a manner as to effect population; and as the people are now known to be nine millions, the proportion of land which supports the inhabitants, is four acres to each person. The inhabitants wholly supported

* Arable land,	14,000,000
Grass land,	20,000,000
Hops, gardens, part of the nurseries, houses, &c.	2,000,000
	36,000,000

by

by agriculture are six millions*, or two-thirds of the whole number of souls: the proportion of these inhabitants to such part of the soil as is purely agricultural, is nearly as one person to five acres and an half. Not but that the extremes vary much, as there are some few grazing farms, with only one soul to fifty, and arable farms that are peopled in the proportion of one person to three acres of land. In point of produce, the commons, in their present state, apparently, though I think not really, afford entire support to human beings in the proportion of one to an hundred acres. But by being enclosed, and brought into the present ordinary cultivation of the country, every four acres might do the same. Should agriculture experience a rapid advance towards perfection, as there is reason to imagine it will, every three acres would, in a few years, be capable of supporting its inhabitant; and as, from its nature, it might certainly be carried on from one degree of perfection to another, it may even arrive at such

---

* Cultivators of farms, six persons to every hundred acres, is	2,340,000
Ditto of gardens, hop-grounds, nurseries, &c. - - - - - -	800,000
Smiths, wheelwrights, bricklayers, masons, carpenters, painters, plumbers, glaziers, various manufacturers of furniture, woollen cloths, and making it up, linen, and making it up, leather, and making it into shoes, boots, &c. hose, harness, and saddlery: as many of each of these description of persons as are wholly employed by the cultivators of the soil, men, women, and children, about seven persons to each farm of 100 acres, is - - - - - - - - - - - - -	2,800,000
The like of millers, bakers, maltsters, brewers, distillers, starch-makers, dealers in corn, and persons employed in the commerce of corn - - - - - - - - - - - -	500,000
The landlords of farms - - - - - - - - - - - - -	40,000
Persons supported by taxes on the produce of land - - -	20,000
Total - - - - - - -	6,000,000

J. M.

a pitch of excellence, as that every two acres of land shall support its man.

It is probable that there are large districts in China, the population of which equals its number of acres. The whole of China Proper, excepting only its rocks and mountains, has probably as many inhabitants as acres.!

The farmers in Tuscany prove, that the earth, under favourable circumstances, is capable of supporting a population whose numbers exceed the number of its acres (English statute measure). Mr. SIMONDE, a practical agriculturist, says, that on 2a. 1r. 12½p. a man, with his family, had lived for thirty years, and brought up five sons and two daughters. The same author says, the most usual extent of farms on the hills of Tuscany, is that of 4a. 1r. 30p.; but as the landlords of that country have one moiety of the produce for rent, the other moiety is all that the tenant can appropriate to the support of himself and his family: in this manner 2a. 0r. 35p. of land supports a family.—*Monthly Review*, vol. xxxvi. p. 489.

The potatoe growers near London, crop their land in such a manner as to have equal quantities of potatoes, wheat, and clover, which is a system that deserves to be admired and extended.

One acre of wheat, forty bushels, which weigh one ton one hundred weight and forty-eight pounds, and that may be manufactured into bread, sufficient to supply a family of five persons for one whole year.

One acre of potatoes, which weigh eight tons, or six times as much as the wheat.

One acre of clover, which yields sixteen tons of succulent green food, that are equivalent to two tons of hay, and eight tons of green clover, or four tons of hay. In any of these ways, one acre of clover, and a few perches of

of potatoes, are sufficient for the support of a cow of an average breed, and she is capable of maintaining two-thirds of a poor man's family; or one good cow, well fed and managed, can give entire support to the whole of such a family. Three acres of land tilled in this manner, and the crops sold in the London markets, would produce, in

Potatoes,	£. 30
Wheat,	15
Clover,	20
Together,	£. 65

Which averages, per acre per annum, 21*l.* 13*s.* 4*d.*

NOTES ON THIS SUBJECT, WRITTEN IN THE MARGIN OF THE FORMER REPORTS, &c.

'A general enclosure and division of a common, in a county so populous as this, upon which so many parishes have a right of common, may be said to be a means of cutting it into very small pieces, upon which, individually, no very beneficial system of husbandry could, on such small parcels, be adopted; but this supposed evil would soon be cured, by the number of sales and exchanges which would take place so near the metropolis.'—*Board of Agriculture.*

'I am thoroughly convinced, that if every acre of land in the nation was cultivated, it would provide very sufficiently for five times the number of inhabitants there is in it; and it would increase the wealth of every landholder, to an amount that perhaps he has not an idea of.'—*Board of Agriculture.*

'Commons are certainly best enclosed, as they afford no real benefit to the poor who live on, or near them; for, although a cow turned on the common may get her own living for three months, which is as much as she will be able to do, yet the poor cottager neither has the means of buying a cow, nor the right of keeping her on the commons.'—*P. F.*

'Must the lands of England lie waste, and the people be starved? or must something effectual be done to prevent the avarice and power of individuals from taking advantage of what they call their parliamentary interests, to defeat law and common justice? I am much pleased with the

the general enclosure bill, and mind not by what means the commons may, by enclosure, be rendered useful to the community, provided that absolutely necessary work be done.'—*W. P.*

To the authors of all these Notes I beg leave to reply, that small commons, in the vicinity of London, might be advantageously enclosed on a parochial plan, namely, by an allotment to the Lord of the Manor, another in lieu of tithes, and the rest to the parish, who should apply the rents, one-half towards the land-tax, and the other half in aid of the poor-rates. A plan something like this was adopted nearly forty years ago, at Walworth, in the county of Surrey, and answered completely.—*J. M.*

SECT. II.—COMMON FIELDS.

THE common fields in the parish of Harrow, a hamlet of Pinner, are now under enclosure; when th can be classed with the enclosed land, the common fiel in this county will be reduced to ten or twelve thousa acres, which consists of such a soil as is the most prop for growing turnips and barley.

Common arable fields are divided into too many sm properties. I have known thirty landlords in a field 200 acres, and the property of each so divided, as to in ten or twenty places, containing, from an acre or tw downwards, to fifteen perches; and in a field of 5 acres, I have met with patches of arable land, conta ing eight perches each. In this instance, the aver size of all the pieces in the field was under an acre. every case, they lie in long, narrow, winding, or wor like slips. Land so distributed, occasions great loss time to the farmer, in removing his teams and labourer and, what is of more importance, *he can neither cross plough, harrow, or cleanse such land, in a workman-lik manner. Neither can he sow any green or meliorating crops, vary the usual impoverishing succession, or even destroy the vermin.*

vermin. In short, the cultivator of this land finds his expenses are considerably more, and his crops much less, than what they might be, if it were laid together, and well fenced.

Common meadows are liable to some of the same inconveniences, together with others which are peculiar to themselves. They seldom are manured, as that cannot be done without other persons sharing the increase which such dressing would produce: for that reason, their crop of grass is small in quantity, and poor in quality; and after that has been made into hay, and carried off, they are subject to most of the bad consequences which belong to waste land.

I have some reason to believe, that in consequence of the opinion and advice which I gave in the former impression of this Work, that (if the commonage in the district of adhesive loam were destroyed, and every man's land united, it would be mostly laid down for the production of hay, in which state it would *double* the present rent on a twenty-one years' lease, and at the end of that time, would most probably be found in such a state of rich permanent grass, as to be of *three times* its present value; and that enclosure then promised to be the greatest improvement for the land-owners, that could be made on that *strong soil*), the proprietors of it are now enclosing under legislative authority, all the land westward from Harrow, by which they are on the point of reaping great additional wealth.

Oak and elm seem to grow with nearly equal health on the whole of this district, though two or three places, of a few acres each, tend more to the oak. On the rest, the elm has rather the preference, and stands so close in the hedge-rows, that I have numbered eight trees in twenty feet. The oaks are scandalously reduced to pollards, and the elms are so in a less degree.

Enclosing the common fields, which consist of a *turnip and barley soil*, frees both the landlord and the farmer from the shackles of an exhausting and obsolete rotation of crops, and places them at liberty to stipulate for cultivating the soil in the most improved manner, keeping it clean; in better heart, raising such roots and green crops as are in the greatest demand at market, and only growing a crop of corn for the sake of renewing the course of green and root crops. In this manner, intelligent men, after enclosure, can double the produce of their land.

For further observations on this subject, see Rotation of Crops; and also see the Herefordshire quarto Report, page 70.

SECT. III.—ENFIELD PARISH AND CHASE.

THE parish of Enfield contains, in statute acres, as follows:

	Acres.	R.	P.
Enclosed pasture,	1646	3	24
Enclosed arable and pasture,	1245	1	13
Lately common-field arable, now enclosed land,	2746	3	29
Lately marsh-land, a common meadow, now enclosed,	794	0	9
The parish allotment from the chase originally set out, subject to tithes; but lately enclosed, and exonerated from the same,	1532	2	6
Part of the chase enclosed by the first Act, and discharged from the payment of tithes,	200	0	0
The whole parish of Enfield, exclusive of the King's allotment, and that part of the chase which is set apart in lieu of predial and vicarial tithes, contains	8165	0	1

It

It is now upwards of twenty years since the chase was enclosed; and it is said that, owing to the difficulty of the enterprize, and the original purchasers being mostly gentlemen who were retiring from trade, it is much less generally improved than it might otherwise have been.

This tract of land, in its original state, abounded with trees and bushes, which seemed to make it necessary for the cultivator to dig up the soil, and roots, before any of the ordinary operations of husbandry could take place. These were works which not only required much labour to effect, but also a large expenditure of money, for which there was no *immediate* prospect of return. The increase of stackwood and bavins so far exceeded the usual demand for these articles, as to reduce their price below what was paid the woodmen for labour. Inexperienced farmers became alarmed, and, in consequence, set themselves about trying confined, partial, and penurious experiments, ill calculated to succeed on an extensive, raw, crude soil, which had from the earliest ages been shut up by a thick foliage, in an excess of damp, excluded from the benign influence of the solar rays, and every other power of evaporation. These operations only cleared small patches of land at a time, and left such cleared ground surrounded on all sides by wood, and that, by the redundancy of damp which it occasioned, continued the disorder with which the soil was afflicted.

Digging up the roots, and the soil, as before mentioned, would unavoidably bury great part of the surface mould, which was by much the best, and in its stead turn up a worthless clay, a perfect enemy to the whole vegetable tribe; or at least, it would mix so much bad soil with the small portion of good, as to produce together a new surface, certainly much inferior to the one destroyed. It ought not therefore to excite surprize, that under

these disadvantages, the soil should sullenly and reluctantly yield a return of so much as the seed sown. In fact, it could not happen otherwise, till such time as the woods, becoming more generally cleared, the superabundant water drained off, and the excessive damps evaporated, the soil should obtain a proper degree of dryness. Nor even then could great returns be expected, without the application of turf-ashes, lime, marl, or chalk, to correct the natural acidity and crudeness of the soil. But in order to make it permanently productive, the manure of animals should have been laid on this land in a liberal manner.

The greater part of the occupiers not knowing how to cultivate this soil to advantage, and being fearful of incurring loss, by any mistake in the management of it, let it lie waste for several years; and probably much of it would have continued so till this time, had not the better directed exertions of GEORGE BYNG, Esq. the present worthy member of this county, together with those of FRANCIS RUSSELL, Esq. and Dr. WILKINSON, shown the way to success.

The parties concerned in the cultivation of it, should have began by felling the timber in the proper season, and disposing of it at the best market; next pared the old sward, and grubbed all the roots; and, as soon as they were dry, burnt the roots, bushes and sward, into ashes; then ploughed these ashes in with a very thin furrow (in order to avoid raising the wretched subsoil to the surface); after this, they should have spread the lime or chalk, and harrowed it in. I say, had this method been adopted by the first cultivators of the chase, we should not have had it stated that the soil was sullen and unproductive. At least, it would in that state have grown tares, and perhaps cole, which should have been eaten by cattle on the land

which

which produced them. After one or both of these crops had been grown and consumed on the land, some of it would be found in a condition to grow turnips; these should also have been fed on the land, so long as it was sufficiently dry, and the rest might have been rotted on the soil for manure. This should have been annually repeated, and the land plentifully supplied with manure, brought from town and the farm-yard, until the soil had acquired a sufficient degree of richness to be *laid down to permanent grass.*

The soil of the chase is of too stubborn a nature to answer in a course of aration, particularly as it is so near the metropolis, and where the expenses of horse-keep, and men's labour, are so high, that they would consume all the produce of such land. It should therefore be only pared, burnt, ploughed, drained, limed, and manured, and then laid down clean and in good heart, to permanent grass. Indeed, wherever there is a clean skin of good plants already, it will be sufficient that it be well drained and manured; in which case the grass will be sure to improve, and in a few years become good meadow. In short, the whole does not differ so much from the land at *Hendon*, in point of quality, but that successive manuring for the space of one hundred years, as the latter has experienced, may render the *chase* as famous for the production of prime hay, as that place now is.

The west side of the chase has a subsoil of marl, which is indicated by the spontaneous production of beech; though it is frequently interrupted by, and mixed with, yellow clay; and in general, the marl is so loaded with clay, as to prevent even the best of it from strongly effervescing with acids.

The whole soil is of a poor complexion, and consists of alternate jambs of flinty gravel and yellowish clay, which is

is an unfortunate circumstance to the cultivator, owing to their requiring a different treatment; and the change is so sudden and frequent, as to produce the necessity of cultivating them in the same manner.

The following valuable communication was received by the Author from Dr. WILKINSON, in July 1805.

'The enclosure of Enfield-chase, which took place in 1803, was not confined to the 1500 acres of waste land, but likewise included 2746 acres of common fields, and 794 acres of marsh land.

'*Common-rights, and the Value of Land.*—The common-rights were fixed at 17*s.* per annum, which the Commissioners valued at 28 years' purchase, or 23*l.* 16*s.* One right was allowed for every house that had not been built within the memory of man, unless the new erection happened to stand upon an old scite. The quantity of chase land allowed for each right, varied, from one half to three-quarters of an acre: the timber and underwood growing on the land, was to be paid for separately. The rights, previous to the allotment of the chase, sold at various prices, from 17*l.* to 24*l.* the Commissioners accommodating the purchaser, by laying the land given in place of these rights, immediately contiguous to his own property.

'At the commencement of the enclosure, some single acres, or small lots from two to four acres, sold at 100*l.* per acre, which was considered as a conveniency price. I gave the Commissioners 700*l.* for fourteen acres, situated immediately at the back of my house. By the purchase of common-rights of different freeholders, I afterwards added above 60 acres to the above, which includes noble range of woodland, which bounds and shelters my estate for above half a mile. The purchase cost me from 34*l.* to 38*l.* per acre: for some small lots, I was obliged

to

to pay at the rate of 40*l.* per acre. Several lots on the chase, of from four to eight acres, sold for 34*l.* per acre. When, however, 90 acres were brought to the hammer at once by the Commissioners, in order to raise a sum of money to defray the expenses of fences and buildings for the tithe allotments, the quantity sold, which was divided into five lots, did not average above 27*l.* per acre. The land, I must observe, was not of the best quality.

'In the common fields, land was sold by the Commissioners at a much higher price, from 100*l.* to 150*l.* per acre. The Act gave them power to sell, in order to raise money to defray the expenses of the Bill; but it must be considered, that where common-field land was sold, the owners were to be indemnified.

'*Rent of Land.*—The land in the common fields, which is formed of a rich staple, has been lett, since the enclosure, at a very high price; from 50*s.* to 3*l.* 10*s.* and some lots at 4*l.* per acre. The chase land has been lett at 18*s.* and 21*s.* per acre. The tithe-farm, consisting of 300 acres, is lett on a twenty-one years' lease, at 15*s.* per acre.

'*Timber.*—The timber and underwood growing on the chase at the time of the enclosure, were to be paid for by the owners of the land. The money arising from the sale, was to be lodged in the Bank, in the Accomptant-general's name, for the benefit of the parish, and applicable to the same purposes as the timber had been under the original Act of Enclosure. As the parish had annually, for the last four years, cut down a considerable number of oaks, in aid of the poor's-rates, the value of the wood was much diminished. I cannot, at present, ascertain accurately the interest which will be produced, as the whole, I believe, has not yet been paid; but I should suppose we may expect upwards of 400*l.* per ann.

This

This will prove a very considerable relief to the parish, at a time when the rates must necessarily be high in every district of the kingdom. It is not liable to be diminished by parish officers, as the principal is placed beyond their controul.

'When the original enclosure of the chase took place, in Edmonton parish they cut down the timber, and grubbed up the underwood from their allotment: in Enfield, they not only kept the greatest part of their timber standing, but wisely preserved the bushes: by this means they secured to themselves a succession of timber, for the underwood is the best nursery of the seedling oaks, and effectually preserves them from the bite of cattle. This observation is worthy of attention, when the practice of turning woods into groves, by clearing away the underwood, is become so fashionable; a practice which threatens destruction to all succession of timber.

'I have preserved about 80 acres of woodland at the back of my house and grounds, which, on account of the shelter and ornament of the trees, I wish to keep standing. It is not my intention to grub up the bushes, but to retain them as the nurseries of *succession timber*, which, some years hence, will allow of an annual fall, the ground being now well stocked with vigorous and thriving oaks.

'*Tithes.*—In the enclosure of Edmonton-common, which preceded that of Enfield, the tithe-owner had been satisfied with one-ninth of the grass-land, and one-fifth of the arable. The proportion of one-eighth of the grass-land was demanded of Enfield: this was resisted by the freeholders, and two-seventeenths were proposed and accepted. The arable stood at one-fifth. Several of the freeholders expressed a wish, that, under the present Bill, the *old enclosures* should be exonerated from tithes: the tithe-owners agreed to take *common-field land* in place of tithes,

tithes, where the owner had any to give; in other cases, to take chase land as far as it would go. Provided the allotments on the chase should not prove sufficient to discharge the value of the tithes from the respective property of the landholders who had no common-field land to give, the deficiency was in that case to be made good by a corn rent, to be calculated on the average price of corn of the last 21 years, and to be regulated by the price of wheat every 21 years. These corn rents the Commissioners offered to sell to the owners of the land at 30 years' purchase.

'A serious difficulty arose in the progress of the Bill, owing to the objection that was made to the sale of any of the tithe land; the church not being allowed to alienate any of its property. Yet without some such clause, Trinity College, the owner of the tithes, refused to concur in the Bill, as they had already been put to such great expenses for building on other enclosures. This was at length settled, by making provision for such an annual sum, to be invested in the funds, as should accumulate, in forty years, to the money expended, when the whole is to be invested in the purchase of land. Fifteen hundred pounds were to be expended in building on the tithe-farm, which consists of 300 acres.

'*Present State of the newly enclosed Land.*—However the community may eventually be benefited by the enclosure, the picturesque beauty of the country has been much diminished. The timber has been almost generally cut down, except what I have preserved in the neighbourhood of White Webbs. The grubbing up the roots has proved expensive, where the trees were thick; the price paid has been 8*s.* per stack. On several allotments, the clearing of the land amounts to upwards of 7*l.* per acre. In some instances, the wood was offered for the labour.

'*Paring*

'*Paring and Burning*—has been practised by some, and with success; but the general method has been oats on the inverted turf. Many have unfortunately adopted the old plan of taking either a crop of wheat in autumn, or of oats in spring; thus ruining the land by a second crop of white corn.

'The rental of the parish, according to a late valuation, is 24,000*l.* per annum: it had previously stood at 18,000*l.*

'Edmonton-common is now in a state of cultivation.

'The crown lands have been brought into a state of cultivation, chiefly by the exertions of — PARISH, Esq. and of — CHAMBERS, Esq. who occupy large farms in this district which formerly belonged to Messrs. RUSSELL and JAMES. It is pleasing to behold affluence thus usefully employed, in giving fertility to the soil, and in clothing the barren waste with waving corn. The poor find employment, and the resources of the country are increased, by these patriotic exertions.'

NOTE.

'South Mims enclosure is also part of Enfield-chase, and consists of near 1000 acres. In its unenclosed state, it is supposed not to have yielded the parish at large more than 2*s.* an acre per annum; but since its enclosure, it is worth, on an average, 15*s.* an acre per annum. It is at present in tillage; but in a few years it may be converted into grass, which will still further increase its value.'—*P. F.*

SECT.

SECT. IV.—STANWELL ENCLOSURE.

The *waste land* of the parish of Stanwell, previous to the enclosure, consisted of somewhat more than 500 acres, of which about 350 were part of Hounslow-heath. In their former state, they were worth little or nothing, but such was the effect of enclosing them, that they were lett immediately afterwards from 15*s.* to 25*s.* an acre, and on an average at 1*l.*

The common arable fields were, on being enclosed, almost throughout the whole parish improved in rent from about 14*s.* to 1*l.* an acre, and much of the best of them, near Stains turnpike-road, to 25*s.* or 30*s.*

I am informed that 30 acres were set apart, and lett for 30*l.* per ann. and that all the cottagers in the parish, who do not receive alms, and rent a cottage of more than 8*l.* a year, are annually to have such rent divided among them, in equal proportion.

By a clause in the Act, power was given to the Commissioners named in it, to sell by auction such part of the heath as was necessary to defray the expenses of the enclosure. The waste land thus sold produced 21*l.* per acre.

The occupiers have found great advantage in sowing artificial grasses and turnips, in that part of the enclosure which till then had been in common arable fields, and consequently never had produced those crops. They are now enabled to keep as much stock on part of the land as they did on the whole, and such of them as pared and burnt their allotments on the heath, are reaping equal advantages. But unfortunately, most of them ploughed without paring and burning, and they now labour under very great disadvantages on that account. They find that the dwarf-heath is of an imperishable nature, and that

that *it*, together with the remains of the *furze* and *bent*, is exceedingly troublesome to plough and harrow; it also keeps the land too hollow and spongy, so that even rolling is no security, as immediately after the passing of the roll, the elasticity of the heath raises it to its former height. The plants of corn come up well, and continue to thrive till nearly half grown, at which time they die away, and produce not half a crop. On the contrary, Mr. East (and perhaps some others) pared and burnt his allotment, and finds no such inconvenience. I have to blame him for taking a crop of corn in the first instance: the wiser way would have been, 1st, turnips; 2d, tares; 3d, turnips; 4th, barley; then clover.

SECT. V.—SHEEP DOWNS.

The present management of sheep downs, is not only disgraceful to the owners and occupiers of such land, but it is a considerable drawback on the agricultural character of the nation itself; since they may unquestionably be applied to a much better purpose. There are but few of them which have not depth of topsoil sufficient for the production of corn and pulse, though in their present application, as mere pasturage for sheep, which are not allowed to dung on them, they are not better than commons. Indeed they are in a *worse* state than if they were in common, and the sheep continued on them day and night.

All the very thin and clean-skinned downs, sheep-walks, and other grass land, should be continued in pasture; and the sheep should be folded nightly in summer, and fed in winter on the poorer parts of such land; which would soon improve it, so much as to make it average the better.

better. The fold might then be discontinued; but this land should always have the advantage of sheep lying on it, which would advance the whole into a state of respectable pasture. In other cases, where the vegetable mould is of such a depth as to admit of being ploughed without deterioration, it may be occasionally either arable or pasture.

No good system of husbandry can require any grassland to be sacrificed, in such a manner as is now done by the sheep-walks and downs; rather let the farmers double or treble the quantity of their green and root crops, by which means they may support as great a number of sheep as they now do, on less than half their present quantity of land, and render that half as rich as a kitchen-garden.

Most of the land called down, has a subsoil of chalk, than which it is well known there cannot possibly be a better for the production of *sainfoin*, or more congenial to the growth of that valuable plant, which, either green or in hay, is allowed to be *the best food that can be given to sheep and horses.*

The South and West Country downs are naturally similar to the Isle of Thanet, which has lately acquired the name of a garden, although within the memory of men now living, much of the land in the upper part of that island was poor barren sheep-walk. Now that very land is covered with crops, nearly equal to what the best land produced formerly *.

It has been the constant and invariable practice, from time

* A dry, loose, chalky mould, from four to six inches deep, mixed with flints on a subsoil of dry hard chalk, a great part of it naturally as poor land as any in the kingdom, but which, by dint of cultivation and

time immemorial, for the whole produce of sheep-downs to be barbarously carried off them by sheep kept for that purpose, and of depositing it, in the state of manure, on the arable land where they are folded at night. As no return of manure is ever made to these downs, they are entirely indebted to Nature for their scanty produce: therefore it is evident, the *best* land in England would not be in much better plight after suffering in a similar manner.

All the sheep downs in the South and West of England, have undergone the severest depredation time out of mind; and their present poverty is the consequence of such a degree of exhaustion as no other land ever suffered. Summer and winter, their whole produce has uniformly been carried off, and deposited on the arable land, in order to fill the farmer's barn, by the trifling labour of cultivating only a corner of his land. Perhaps one-fourth of it is, by sheep and the fold, kept very rich, and the other three-fourths are nearly ruined; by which bad practice, the landlords and the community suffer great loss.

So far as my observations have extended, sheep downs are rather on the wane, by the much wiser appropriation of them to the free use of the plough. I hope to see them still more on the decline, which I think cannot fail to take place, as it is incontrovertibly true, that they may be occupied under a much better system.

---

manure, is made to produce most excellent crops of corn of the first quality.'—Boys' Kent, pages 8, 15, 16, 17, 34, 35, 37, and 77. Surrey has also its downs of a similar quality, nine-tenths of which have long been brought into aration. Also see Mr. GILBERT's practice on the hills near Eastbourne, in the Annals of Agriculture, vol. xxii. page 233, which he improved from half-a-crown to fifteen shillings an acre.

No man capable of giving a sound judgment on these matters, can ride over the South Downs, without daily meeting with instances of the wisdom and profit of cultivating them.—*J. M.*

It

It is the more sheltered situations on these downs that are first chosen for the purpose of being reclaimed from their present state of poverty, and of being brought under the dominion of the plough. This circumstance suggests the propriety of planting and raising broad hedge-rows or belts, at least to encompass each farm, and occasionally to add sub-division fences. The highest and most exposed tops of all the hills should be planted with beech, and such other trees and bushes as are known to be well calculated to succeed on a calcareous soil, in a very exposed situation; *as plantations and hedges are the only means of procuring that moisture and warmth on the downs, which are necessary to produce rich pasturage, large green crops, and a much greater number of animals.*

That plantations would succeed on these hills, see the Wiltshire Report, quarto, page 12; and the Dorsetshire Report, quarto, page 33: and for proofs that beech would succeed both as timber, belts, and fences, on the more exposed heights of the chalk-hills in the South and West of England, and on the calcareous hills in other places, in both England and Scotland, see MARSHALL's Southern Counties, vol. ii. pages 316, 317, 318, and 366.

Till this is done, it is in vain for the farmers of wastes, downs, and sheep-walks, to attempt the breeding, rearing, and keeping the best stock; but a division of these lands, and the raising live hedges and plantations with judgment, would be the means of acquiring that equable temperature which is essential to the perfection of vegetable and animal health.

This temperate climate being procured, the improvement of animals might next take place; it would almost be the necessary consequence of superior feed, shelter, shade, and more equal warmth.

By doing these things, not only the proper proportion of moisture and warmth might be obtained, but, in due season, the plantations would afford a considerable profit.

It is stated, that the South Downs, in their present state, support one sheep and a half per acre*, and that the county of Dorset supports *one sheep per acre*†, *including their richest bottom land.* It is possible, that, exclusive of all cultivated land, the sheep downs of the South and West of England, taken together, may contain one sheep on every acre of land: thus yielding a scanty miserable produce of not more than 10*s.* *per acre.* The farmer would not obtain much credit, in my opinion, who could not make the same district produce him *six or seven times that sum.*

It cannot in reason be expected, that land which has been depredated and injured in the manner beforementioned, without intermission, during several, perhaps many, centuries, should be found immediately able to bear a succession of three or more corn crops‡. No: on the contrary, such land should, during a few years, be successively sown with green crops only, all of which ought to be eaten on the spot where they grow. This system, strictly followed, and then laying it down with sainfoin in one thin crop of spring corn, would furnish a source

---

* YOUNG's Annals.

† CLARIDGE's Report of Dorsetshire.

‡ As is too generally practised on the breaking up down land. It is a fundamental error in cropping in the first instance, together with the cry of *interest* in some farmers, and the prejudice of *old habits* in others (who have been long used to large sheep-walks), which have been the powerful means of delaying the general cultivation of the downs, and also most unjustly brought the beneficial practice of paring and burning any very rough old turf, into disrepute with some Correspondents of the Board.—*J. M.*

of

of plenty for near twenty years; and provided justice be done in the management of it during that time, it would then be fit for all the purposes of alternate tillage and pasture in perpetuity.

To improve these downs, a total stop should be put to dung carrying by sheep, excepting only in the cases of water-meadow, which may be fed by sheep, as usual, during the spring; but they should be folded at night on the poorest parts of the downs, or on poor land recently ploughed from the old sward of the downs. Also, pare, burn, and manure, to get *tares, turnips, cole; and repeat the crops of tares, turnips, cole: then barley, red clover, tares, turnips, cole, barley, sainfoin to continue. Divide and shelter the whole by hedges and plantations, and feed all these crops (except the barley), upon the very soil they grow in, by sheep, and no one will hereafter have any reason to say the downs are beyond the power of being improved.*

In short, it is a proper selection of such green crops as are suitable to any given soil, a judicious arrangement of the rotation of them when selected, and feeding them off with sheep, that are the most likely means to improve the soil, as well as greatly to increase the number, and enhance the value, of that most useful animal.

Carrying these ideas completely into execution, would not only *load our tables with mutton*, but would also *give additional extension and support to the woollen manufactory*, and diffuse plenty and cheerfulness among numerous ranks of the community.

SECT. VI.—FENCES.

THE hedges are generally full of live wood, consisting mostly of hawthorn, elm, and maple, with some black thorns, crabs, bryers and damsons: the last frequently very fruitful, which is the cause of its being destroyed. All these are made anew once in ten or twelve years; at which time the whole is cut down to within a few inches of the bank. The scouring of the ditch is thrown up, a very thin stake and edder hedge is formed, and all the rest of the wood is made into bavins, and sold principally to bakers, at about a guinea a hundred delivered. In two or three years, the live wood is grown so thick again, as hardly to admit of being seen through. This method is found to answer very well. The mould thrown out of the ditch may be considered as earthing up the plants, and it is always done loosely. The plants thus grow with vigour on the sides of the bank as well as on the top, thereby preserving the bank from destruction by cattle. It is far superior to the methods practised in some other counties, of making a solid wall-like face to the bank, in some cases of stone, which smothers all the shoots that would otherwise grow from the sides of the said bank, and of course exposes it to be pulled down by the horns of neat cattle, at the same time that it greatly reduces the produce of the hedge.

In planting new quick hedges, it would probably be an improvement on the old practice, to raise two rows of thorns two or three feet apart. When grown up, they should be cut alternately, one every five or six years. Thus the cut wood would be ten or twelve years old, and the other, left for a fence, would be five or six, which would be sufficient both for a fence, and to protect the young shoots from the bite of cattle on one side. Should there

there be any cattle on the other side of the hedge, a few loose thorns in the ditch, a temporary fence, or wattles, would secure the quicks from their depredation. This regulation would make the hedges a source of constant profit.

Quicks should be grown in a nursery of rather good land, be about five years growth from the haw, and have been twice transplanted, in order to give them strength, and increase the number of roots. Never buy quick-sets after they have been taken up, for such are mostly stunted plants, drawn on commons, which canker, and never grow well. It is a custom with poor people who live on the borders of commons where an enclosure is taking place, to collect the wild quicks, reduce the stem to two or three inches in length, and sell the roots. They sell them at a lower price than the nurserymen do, but they never make a good fence.

The usual method of planting quicks on the side of a declivity between the ditch and the bank, is almost the worst possible. Let the soil be what it may, the operation of the elements will make it crumble away from the roots, and leave the sets without sufficient mould to support them. This was particularly the case at Stanwell, in this county.

If the parties make choice of planting young quicks, I would recommend a low bank of sufficient width (not less than four feet wide at top), to allow of planting two double rows, about two feet six inches asunder, on the flat surface of the bank. This bank may be raised with earth taken from a ditch on each side of it, and care should be taken to place the roots in such a manner as to penetrate the best mould, and that the sides are sloped just enough to leave no fear of their mouldering down.

I am apprehensive no contrivance can excuse the party from the expense of a dead hedge, posts and rails, hurdles,

or wattles, on each side of the young hedge, to keep cattle off; unless the adjoining closes can be kept free from large cattle and sheep till it is able to protect itself; as the same is frequently provided for by the Act for enclosing common land.

But the method above all others the best, if it should be found to succeed, as it perhaps may on a moist soil, in a moist climate, is the grubbing of black thorns five or six feet high, in copses, &c. trimming the roots, and planting them closely on one spit of the best mould laid on the turf. This should be taken from where the ditches are intended to be made, and chopped well to pieces. Then raise a bank on their roots round their stems, about three feet high, and cut their tops level, two feet above the bank, and they will form a perfect hedge.

For fences to stand the sea breeze—see the Somerset Report, quarto, pages 171 and 179.

So far as the mere purpose of a fence is intended or desired, stone walls are the best of all, as they occasion the least waste of ground, do no injury to the crops, harbour less vermin, and are free from the weeds and rubbish that invariably accompany hedges. Nor be it forgotten, that they nearly exclude hunters, who are another species of destroyers: those imitators of the life of savages, are as destructive in a well cultivated country, as foxes and wolves would be in a hen-roost or a sheep-fold.

In all newly-enclosed land, the landlord can scarcely take sufficient care to secure the farmer's attentive protection of the young fences. The proprietor, or his agent, should make it his business to see that the tenant complies with his contract, for securing the tender growth of young quicks entirely free from the bite of cattle. This is essentially necessary to be attended to in every particular, during the first ten years, or until the hedges become matured.

So

So much indeed depends on it, that if the farmer shows the least neglect in this matter, it should be in the power of the landlord to take the fences into his own management, and to charge the tenant with every expense attending it, in order that they may be perfectly protected from every species of injury.

Herbage succeeds better in close situations than corn, which is successful in places more exposed. Hence, in the making of hedge-rows on new enclosures, particular attention should be paid to the climate, and to the nature, elevation and aspect of the soil, and also to the manner in which its owner intends it should be cropped. Equal care should be taken, to guard against the extremes of too much exposure, and that of creating a thick damp atmosphere. For instance, a soil and situation which are naturally damp, divided into small enclosures by high hedges, especially if they abound with trees, is totally unfit for the production of corn, though it may be very suitable for meadow. Again, the same soil, exposed to a northern aspect, and enclosed with wood, would be so shut out from the rays of the sun and the currents of air, as to occasion a redundancy of nearly stagnant moisture, which would destroy the better plants, and leave an herbage of no value to a farmer. On the contrary, remove the copse, prune the trees at least to the height of fifteen feet, drain the land, and keep the ditches well cleansed, and it would make good permanent pasture. And if any circumstance should render it desirable to have it in tillage, enlarge the enclosures, prune the side-branches off the trees to the height of twenty or thirty feet, and clip the hedges, with the intent of freely admitting the rays of the sun, and of removing every impediment out of the way of the currents of the atmosphere, and the same soil would become fit for many of the purposes of aration.

Any

themselves equally day after day, and having no view of a change of pasture, they would rest quietly. Neat cattle would have a larger pasture by one acre in ten, or sheep by one in five. These reasons are detailed from my own experience, and they seem to make it evident, that enclosures may be too small for the most profitable system of grazing; they also nearly demonstrate, that stock should not be habituated to removal. The only instance in which it can certainly be moved with advantage, is into a richer pasture, so long as it will continue to afford a full bite, before the cattle may be intended for slaughter.

Therefore, those farmers who have land which consists of small enclosures, should divide their stock among them in just proportion to the number they are capable of supporting. To do this, would require a judgment, which no person has, sufficiently correct to divide cattle so exactly, in proportion to the goodness of the several pastures, as should secure all the stock doing equally well. The same stock, on the same land in one piece, would not have to encounter any such difficulty.

Against the loss of pasture by hedges, and the great encouragement they give to weeds, is to be placed the shelter which they afford in severe cold weather, and the shade which the trees in them may give during hot seasons. These are only of small value, as bullocks are never distressed in the hot days of July and August, where they are provided with water to stand in; but where there is no such water, they run with violence to the shade of trees, hedge-rows, or buildings. A quart of tar-water, showered through the nozle of a gardener's pot, over their backs, six or eight times in a summer, probably would keep the flies off, which are the cause of their distress. In cold weather they should not be on the grass-land, but in sheds and yards, and therefore the

shelter

shelter of hedges are useless to them in that season. The whole benefit then which neat cattle can derive from hedge-rows, is confined to such an excess of herbage as 94 acres of grass, enclosed by six acres of hedges (together 100), may be supposed to yield, more than 100 acres that is wholly in grass, and without a hedge.

With respect to sheep, the same difficulties arise: they cannot be moved from close to close with any advantage, neither can they be accurately proportioned to the difference in quality of the enclosures. Tar-water would prevent their being fly-blown; the hedge round a close of ten acres, would shelter them much better in winter than can be done in a field of a hundred; but whether this superior shelter in winter, and shade in summer, be sufficient to make 80 acres of pasture, with 20 more in equal quantities, of hedges and coarse grass, rear and fatten as many sheep as 100 acres in one open piece, or not, my experience is insufficient to determine. Though I feel disposed to prefer enclosures of 40 or 50 acres for the general purpose of a farm, yet every farm should have a well-sheltered close or two, together with dry yards and sheds for the lambing season.

Gates.—Farmers' gates are mostly of oak, five bars, such as are in general use in most parts of England. Ornamented gates are every where to be met with on the private roads to genteel houses.

In some places, the stealing of gate-hooks and iron fastenings is so common, as to induce the farmers to hang and fasten their gates with wood, which is easily done, and they afford equal security with such as are usually made of iron. For the method of hanging gates without iron, see MARSHALL's Southern Counties, vol. ii. p. 107.

CHAP. VII.

ARABLE LAND.

SECT. I.—TILLAGE.

THE *arable land* of this county is, for the most part, confined to common fields. The rest consists of such parts of the said fields, as have lately been enclosed, under separate Acts of Parliament, as at Stanwell and Enfield-chase; and of a field or two here and there, seldom of more than ten or twenty acres together, in other parts of the county.

All the enclosed arable land is supposed to be under	3000 acres
I have before stated the quantity of common-field arable land at about	11,000 acres
making together	14,000 acres

of land in aration within this county, or about one-thirteenth part of the whole; not producing wheat sufficient to supply one-sixtieth part of the inhabitants with bread.

In the operation of ploughing, the ridges are usually cleft every time, in the common-field land (and in the enclosures too, except the second ploughing of fallows and demi-fallows, which is generally done by crossing the former ridges), proportioning the depth of the furrow to that of the topsoil. But in general, the ploughing is deep, and with a wide furrow, which, of course, very much increases the weight or draught, and necessarily requires a strong

a strong team, which, moving with a very slow pace, as all heavy teams do, performs but little work in a day. It is not one time in fifty that they go to plough with so few as three horses; but mostly for the lighter work using four; on rather stronger land, five, and sometimes even six: in every instance, drawing at length. In May 1796, I saw, in one day, two teams, with six horses in each, and three men to attend each team, namely, one to hold the plough, and two to drive the horses, ploughing with a wide furrow, about three quarters of an acre per day. Indeed these long heavy teams of horses do not, on an average, plough more than four or five acres in six days; at an expense, to the owners of such teams, of about thirty shillings an acre for one bad ploughing. I have seen the last ploughing previous to sowing turnips, performed with a team of five horses. A team of six horses in length, with three men attending, were giving the first ploughing to a fallow, at the same time that a field of mine, of a similar soil, divided from the last only by a hedge, was being ploughed by two ponies*.

The ridges vary, from two feet six inches to twenty yards, in width†; the former very round, the latter flat. In the common fields they are frequently of a serpentine shape; but in the enclosures they are more straight, and are always laid in the most suitable direction for carrying off the surface water, for which purpose also, water-furrows, that is, cross-furrows, or what in some places are

* These expensive teams are encouraged by a too general fondness for fine showy fat horses, with sleek skins; particularly on the part of the ploughman, who will rob his master's barn and granary for every sort of corn, over and above his regular allowance, to feed the horses with, in order to keep up this useless appearance of parade and show.—*J. M.*

† The driest soils having the widest ridges, and the wet soils the narrowest.—*J. M.*

called

called grips, are opened by the spade, in order to drain the furrows during winter.

The following memoir on the fertilizing effects of rain, frost, and snow, appeared in the Agricultural Magazine; but it has so much merit, that it cannot be laid too often before agricultural readers. I regret that the philosophical author of it should have made choice of withholding his name.

'1. The general utility of RAIN to vegetation, is sufficiently obvious.

'Water, by entering directly and undecompounded into the substance of plants—by suffering decomposition, that its principles may nourish their growth—by acting, even more than air, as a fit vehicle or medium by which they may be supplied with other nourishment, becomes the grand agent in all the successive productions of vegetables. But springs, rivers, lakes, tides, and the expanse of the ocean, however admirably contrived for the constant diffusion of this element over the surface of the terraqueous globe, would, if there were no other provisions for its supply to vegetation, quickly leave all vegetative life to die, without a chance of its being, under the present laws of Nature, restored. Rains, fogs, and dews, are indispensably necessary to disperse water in that equality, and to apply it in that attenuation, and in those diversities of temperature, without which, no plants could, on most parts of the earth's surface, rise, increase, and attain to maturity. Where the influence of rain is not felt, the face of Nature is but a sandy waste. Even in these humid northern latitudes, a very short continuance of drought is, in summer, sufficient to alarm our minds with just fears of a scanty harvest. The Nile supplies in Egypt for the want of rain, by its periodical inundations; but is itself first swollen by the rains which fall periodically

periodically towards its sources, among the Abyssinian mountains.

'In the months of spring, summer, and early autumn, a large proportion of the *water*, in any climate, is *carried off* by wind, or *taken up* by the decomposition to which an increase of heat is favourable, *in new combinations* in the aërial kingdom. Immediately before the autumnal rains commence, the surface of the earth is comparatively arid; the rivers run considerably within their banks; the depth of the lakes is diminished; the brooks have become dry; and even many of the springs which afforded plenty of water at an earlier time in the season, appear to be now exhausted. Were the vegetation of spring to be, of necessity, renewed, before the rainy months come in, that vegetation would entirely fail, on account of the want of water in or on the earth's surface, for its support.

'Now it appears to me, that the rains which ordinarily commence about the middle or towards the end of September, and, with vicissitudes of snow and frost, prevail till late in March, are principally beneficial as serving to *replenish* the repositories in and near the *surface of the earth*, with those *stores of water* which are indispensably requisite for the vegetation of the ensuing spring and summer.

'It is, in comparison, but a small part of the vegetables of this or any other country, that is merely annual, and are to perish at the end of harvest. But if the rains of September, October, and November, did not bring a new supply of aqueous nourishment to those plants which are to live over winter, the design of Nature for their preservation would be frustrated; and the biennial and perennial plants could no more survive than the annual ones.

'The greater part of the fertile mould at the surface of the earth, is formed of the exuviæ of decayed vegetables.

It is commonly named *vegetable earth*. The fact is universally known, that mould is increased in quantity, chiefly at the end of autumn, every year. But if the season of the annual decay of ripened vegetables were a time of heat and drought, the putrefaction in which that decay consists, would take place much more slowly, and to a much smaller extent; and a large proportion of the matter which moisture and a cold temperature now fix in a liquid or solid state, would, instead of this, fly off in a volatile form, in which it would be lost to the uses of vegetation. Were it not, then, for the autumnal rains, there would not be on the surface of the ground half the present quantity of *vegetable earth*. Our lands would, in this case, soon become entirely incapable of supporting vegetation.

'Besides, the *fossil* and *mineral* parts of Nature are equally prepared for the uses of vegetation by these autumnal and winter rains. They wash down and pulverize calcareous, magnesian, argillaceous, and even siliceous rocks. They act as vehicles for the conveyance of the ores of iron, of nitrous salts deposited in remote places, of sulphur, of carbonaceous matters, &c. which, thus diffused, become great agents in the production of vegetables. Clays, marls, and most other soils, in which earthy, not vegetable matter, predominates, could neither be formed nor retained in a state easily fit for tillage and manure, if it were not that they are so plentifully steeped in the winter rains. It is also by these rains, that soil is continually brought down from those heights and upper extremities of the earth's surface, which are the least accessible to human labour, and is deposited in the vales and plains, where we can the most advantageously avail ourselves of its fertility. The gravel on the surfaces of the rocks, just as the sands on the bed of the ocean, and the channels of the rivers, is, by the attrition which it suffers

suffers by water, at length comminuted into clay and mould.

'Add to this, that water being in some sort an universal solvent, takes up not only oils and earths from decayed vegetables, but also potash, soda, vegetable acids of all sorts, resinous matters, and every other product which they afford. The *vegetable salts* would, for the greater part, be lost by decomposition and aëriform dispersion, were it not for the winter rains, and the temperature which accompanies them. But those salts are the most active and beneficial agents in the renewal of vegetation.

'A vast quantity of *animal matters* are constantly in a process of dissolution at the surface of the earth. Their parts afford matter of nutriment for vegetables, which is highly rich and productive; but in summer, and in drought, the dissolving principles of any animal substance are carried in great part away in air; while under the rains and temperature of winter, they are macerated without volatilization, and are intermixed with the soil so as powerfully to fertilize it. Look at your dunghill in summer: almost all but its carbonaceous and merely earthy parts are carried off by evaporation. In winter, on the other hand, if you do not suffer the water to convey away its juices in a stream, but detain that water in suitable reservoirs around it, how much does it comparatively gain both in weight and in fertilizing power?

'The very *atmosphere* is exhausted by the heat and drought of summer, of those salts, and other substances in a gazeous form, which it is necessary for the uses of vegetation that the air should continually deposit on the surfaces of growing plants. It becomes overcharged with electrical and igneous matter. It becomes deficient in vital air, and carbonic acid gas: it acquires an excess of gas hydrogen and gas nitrogen. Nothing is adequate to

refresh it sufficiently, and to renew those stores, in consuming which it will be again duly salutary to vegetation, except the rains whose fertilizing uses I have thus endeavoured to trace.

'2. The *rains* of winter, however, could not alone, and without any vicissitudes of FROST, contribute nearly so much as they do, by the assistance of frost, to fertilize the ground.

'*Frost* is the change which takes place upon aqueous liquids, when they cannot give out heat to raise the mercury in the thermometer above the point of 32° FAHRENHEIT. A quantity of the heat or caloric, ordinarily latent in *fluid water*, is then more or less suddenly detached from it. A new permanent combination of water with a much smaller proportion of heat or caloric is formed; and to this we give the name of *ice*. This change in the state of aqueous fluids cannot take place till, by the remoteness of the sun, by the vast consumption of caloric in evaporation, by the loss of such quantities of it as are necessarily carried away by the winds in humid air to more western climates, and by the influx of cold winds, rains, &c. from the north-east climates—the free heat or caloric of this climate, and likewise that latent heat or caloric which existed in compounds more ready to part with it than water is, have been, both wholly, or almost wholly, exhausted. Water must then yield a portion of its heat, or caloric, to supply the necessary waste: and frost ensues. During the continuance of frost, there takes place in the atmosphere, and at the surface of the earth, a continual accumulation of caloric, or heat, in the form of electricity. This accumulation is the more considerable, because all new moisture brought by the winds, is congealed as it arrives, till there be in the atmosphere a quantity of caloric in the easily decomposable combination

of

of electricity*, which shall be sufficient, with the help of the sun's rays, and of the caloric coming in air and moisture from other regions of the atmosphere, again to saturate the frozen water with the heat necessary to its liquefaction.

'Now, in undergoing the changes of first freezing and then thawing, that water which the autumnal and winter rains have profusely dispersed over the surface of the earth, effects alterations highly fertilizing on all the terrene and vegetable matters with which it is intermingled; alterations which, if permanent in its liquid state, it would not produce. It had before penetrated through all the fibres and pores of vegetables, as among the particles of mould, and of less dense stones, to which it had access. The frost expands as well as congeals it; and in this expansion *mechanically* pulverizes the clods of earth, bursts even the stones, and breaks the vegetable fibres, with a power by which the quantity of the fertile soil ready to nourish vegetation is largely augmented. Vegetables, however, retaining within them considerable strength of vegetative life, resist the action of frost till it becomes so intense as to overpower their vitality, and either to wither them entirely, or, at least, greatly to lacerate their parts, and hurt their growth.

'Those mechanical effects of frost upon mould and decaying vegetables, are accompanied with many *chymical* changes, such as necessarily attend the agency of water and caloric upon all occasions. Saccharine matter, for instance, is evolved by frost in all vegetables capable of yielding it. The formation of nitrous salts, is greatly promoted by the same action.—Gelatinous matters undergo by it a partial change of nature.—A thousand other chy-

* Electricity seems to me to be merely an oxide of caloric.

mical effects, in like manner, take place. The common tendency of them all, is to leave the matter of the soil at the earth's surface in a state much more suitable than before, for the support of a new vegetation.

'Such are the effects which ensue while the frost commences, and continues unabated. When a thaw comes on, other beneficial changes of course follow.

'The maceration of the vegetables thoroughly affected by the frost, and the pulverization of the soil, are now complete.—New putrefactive processes commence: you may observe, for instance, how soon a potatoe, that has been throughout its substance frozen, becomes entirely rotten after a thaw. The whole soil is now in a state of openness and comminution, in which it can take up and retain, for the expenditure of vegetation, a good deal more water than it could before the frost.—The water on the earth's surface, and in the lakes, springs, rivers, and other conservatories into which it passes, now holds in solution various fertilizing matters, the produce of new chymical combinations, which are destined greatly to enrich the earth. And all these chymical changes by cold and moisture, are accomplished with the smallest loss of the fixed matter of the new compounds by evaporation. Nature just as well as the chymist in his laboratory, performs some of her operations in cold, others of them in heat and, as the chymist, in his experiments in the cold way loses comparatively little by gazeous sublimation; so are the processes of Nature performed in the cold and frosts of winter, adapted to enrich the earth by the fixation of the products, to a degree equal to that in which it is in summer impoverished by the constant volatilization of a great part of whatever products result from the chymical changes which then take place at its surface.

'8. SNOW is merely water frozen in the atmosphere. Its formation takes place when there is an uniform cold

fro

from the surface of the earth to the region of clouds in the air, such as cannot be saturated with heat above the degree of freezing, without an entire abstraction of all the heat which the present clouds contain, more than is required to exist in their substance when it shall be converted into ice. Thus snow is formed by the sudden congelation of vapour. It takes the consistency of snow, not of common ice, because its particles were, when the congelation began, in the state, not of water, but of vapour. It is comparatively less cold than ice; because access of an air highly charged with electricity is more freely admitted among its minute component particles.

'Now this snow tends to fertilize the earth by mitigating at its surface the excessive intensity of the frost. Ice has been found, on account of the air which its interstices admit, to indicate on the thermometer a temperature several degrees higher than was that of the water immediately before its freezing. Snow being in a still looser state of mechanical aggregation, receives among its parts still more of air than can enter into the substance of ice. Besides, the surrounding air abounds now much more than before with electricity, a combination probably of heat with oxygen—one of the most easily soluble of all the compounds into which caloric enters, and therefore ready, upon every mechanical movement, to contribute somewhat to the warming of the snow amidst which it passes. Besides, the dry surface of the ground, if only bound up by frost and remaining bare, could not detain any warmer gales which might pass over it, but would be liable to become continually colder by the contact of air that was colder than itself. Thus, the first use of snow is to hinder the living vegetation of winter from being so much withered as it otherwise would by intense frost; and snow effects this by preserving at the surface of the

ground an atmosphere of a temperature somewhat mitigated.

'Its next use is, still to augment the quantity of moisture which Nature applies in winter to fertilize the soil. After the lakes, rivers, brooks, marshes, springs, and pits have been, by the rains, filled with water; after the mould on the fields has been saturated with as much of the same fluid as it could detain and absorb; a new quantity is yet wanted—to supply for that consumed in the new combinations effected by the frost—to fill the upper reservatories which are, in the drought of summer, to feed the springs—to water those heights on which the liquid could not be detained in any other form than that of snow or ice—and, in short, to fill the soil with as much as possible of a fluid which is in some sort the universal, though not primary and uncompounded element and vehicle of life and vegetation.

'It seems to be certain, that frost not only congeals and consolidates water, but, as well as heat, actually consumes it by decomposition. Hence, ground that has been frozen, without being filled with water in great plenty, would, if not laid for some time under snow, be more acid within a short time after the cessation of the frost, than it was on the preceding summer. Now this effect is happily prevented by the snow, and could not otherwise.

'It is of the utmost importance, that there should be an ample supply of water in readiness to enter among the clods at the moment of the first dissolution of the frost. They then imbibe it the most greedily. But, if not in snow, how otherwise should this supply be provided?

'Long digestive processes, whether in cold or heat, are required for most of the nicer and more delicate operations of chymical art. It is by similar processes, infinitely more perfect in their kind, that the most wonderful chymical changes

changes in nature are accomplished. Now the presence of snow, and the long duration of frost, appear to have some power of this sort in that fertilization of the ground, to which they are made by Nature subservient.

'In the course of ending autumn and winter, there are usually many alternations of rain, frost, and snow. These appear to be requisite, for the use of effectually applying to all diversities of soil, exposure, &c. &c. the full benefit that would arise from even a single course of rain, frost, and snow, where all circumstances are duly favourable to the immediate and adequate operation of that course. Besides, the renewal of rains, frosts, and snows, in the progress of a single season, may be of use, just as repeated distillations, long trains of separating and combining processes in the humid way, or frequent mechanical grindings, mixings, poundings, and siftings, are of importance to the complete attainment of our purposes in art.

'Thus the rains, frosts, and snows of winter, may be considered as so many great operations in agriculture. They do much more to improve and fertilize the ground than all the petty labours of the farmer. By these the barren rock is gradually brought to bear a rich vegetation. Much more, where vegetation has already long flourished, and where human care does the utmost to improve the fertility of Nature, are luxuriant springs, bountiful summers, and rich harvests to be expected, after winters in which there have been frequent and even severe alternations of the accustomed storms.'

Ploughing.—When the intention is to plough more than once, the first should be thin, the slice harrowed to pieces, and freed from root-weeds: the second ploughing should then take place, and be deep; and if the land and season be sufficiently dry, it should be crossways. The third

third ploughing should likewise be deep, and leave the land fit for sowing. In general, deep ploughing is better calculated for preparing the soil than thin; but in case of ploughing in the seed, it should be done with a very thin and narrow furrow. Those ploughs which turn the soil completely upside down, should be preferred to such as leave the slices partly on their edge.

Ploughing the soil before winter, enables it to retain an increased quantity of moisture during the following summer; as, on the other hand, every ploughing in the spring and summer, produces a waste of moisture both by filtration and evaporation. Thus, land that has lain in stubble during the winter, will, when broken up the next summer, plough more dry and crumbly than if it had been ploughed before the winter. In the latter case, it has a similar effect with ploughing it while wet, which of course increases its adhesion, and prevents its crumbling. Hence it follows, that, by a proper attention to the effects of ploughing at different seasons, the husbandman may provide remedies against some of the defects of his soil, and render it more suitable to the seed. For example, if the given soil should naturally be too dry, and not sufficiently adhesive, for the growth of any particular plant which requires to be put into the ground in the spring, by completely preparing the soil in the autumn for the reception of the seed, and by putting the seed in without spring ploughing, he will probably cure both these defects in his soil; except in extreme cases, when it would be advisable to select a more suitable seed. Again, if the seed to be sown should require the soil to be dry and well pulverized at the time of sowing, the ploughings should be deferred till after winter, and performed as late in the spring, and with the land in as dry a state, as circumstances will admit. As these are considerations that apply to every plant, and

every

every soil, they should not be lost sight of in the planning any particular operations.

Hoeing.—The advantage of spring-hoeing autumnal-sown crops, is in cutting up the weeds, loosening the surface of the soil, and airing the roots, which gives them fresh vigour, and in earthing up the plants. But on *hoeing crops generally*, I subscribe to the opinion which Sir JOHN SINCLAIR obtained in Essex, namely: 'It is held by a gentleman of real science, who has practised farming for thirty years, not as an amateur, but literally ploughing and sowing his own fields with his own hands, that drill husbandry, as it is undoubtedly necessary for root and pulse crops, is in all circumstances bad for grain crops. The principle on which the drill husbandry is supported, consists in the advantage of tillering, that is, of throwing out new stems from the lower joint of the principal stems: but he has found by uniform experience, that these new stems or younger brothers, produce a weaker and more imperfect grain, and that they do not flower so early as the first stems, in consequence of which, you must either cut the corn when these last are not fully ripe, or if you let it stand until they are ripe, the primary stems become too ripe, by which the grain becomes flinty, and does not produce so much flour: and that, take equal weight of broadcast grain after root and pulse crops, and equal quantities of drilled grain, the broadcast will always produce more to the miller than the drilled.'

Notwithstanding this, if the land abound with annual weeds, there will be cases in which it would be advisable to sow all the crops in rows for two or three years, in order to keep them clean by hoeing and weeding.

Grubs—may be very much reduced by ploughing, harrowing, scarifying, and rolling arable land, during the months

months of March, April, and May; for the eggs of the fly called father long-legs, and some others, are hatched in February; they continue in a state of grub till the beginning of June; then in crysalis a few weeks; and before the beginning of August, the flies come out, and immediately set about copulation, and depositing their eggs.

Liming—land is not destructive to earth-worms and grubs, nor does it by any means protect crops from their depredation: if it did, such insects would be unknown in all limestone and chalky soils. Thorough culture, and clearing the land from every vegetable for such a length of time as to destroy them by the ploughs and harrows, exposing them to be picked up by rooks and other birds, and by starving the rest to death for want of vegetables for them to eat, seems to be the only methods which promise success. On the breaking up grass-land of every description, paring and burning is the first step, and effectual, for destroying the eggs of grubs and many of the worms, and reducing the number sufficiently for a few years. When they have increased again, so as to threaten their doing much harm, the land should be thoroughly tilled, and freed from such vegetables as can in any manner contribute to their support.

It seems, by some experiments which have lately been made, that a solution of soot and water, showered over land when worms and grubs are destroying the corn, will put a stop to their depredations; and that soot, sown on the land, will have the same effect on being dissolved by the dews or rain: in large quantities, it would even kill many of them.

Steeping.—I am of opinion that most, if not every kind of

of seed, should be steeped, and that in liquid manure, mixed with some poisonous solution, just before it is sowed. This, by clothing it with noxious particles, will either preserve it from the attacks of vermin, or destroy such as may taste of it. There can be no doubt, that in every particularly dry seed time, seed of every kind ought to be steeped just enough to promote a quick vegetation. This method would, at all times, prevent great destruction by vermin, secure a more uniform growth, and greatly improve both the quantity and quality of barley and oats; and sometimes, indeed, procure a crop of clover or turnips, which would, without such precaution, have been lost.

The Chinese husbandman always steeps the seeds he intends to sow, in liquid manure, until they swell, and germination begins to appear; which experience, he says has taught him, to have the effect of hastening the growth of plants, as well as of defending them against insects or grubs. But observe, that caution is necessary, as some steeps are so powerful as to destroy the principle of vegetation; which has been repeatedly experienced, by using the stale brine of salted meat mixed with urine.—*Annals of Agriculture*, vol. xxxii. page 192.

Seed.—The choice of every kind of seed should, as often as possible, be made in the field while it is growing, a short time before it is gathered in. This would, in a great degree, prevent the imposition sometimes practised, of passing a spurious and bad sort of seed for that of good quality and genuine kind.

Farmers hardly need be cautioned against following the pernicious advice of those authors who recommend generally, and without exception, the sowing much less seed

grain

grain than usual, as husbandmen know, by the appearance of every crop, whether too much, or too little, or the proper quantity of seed, had been sown. The principle of economy, which of necessity prevails with every man who is merely a farmer, is a sufficient motive to prevent his sowing an unnecessary quantity of seed. This very principle is powerfully calculated to induce the common farmer to sow, in seed grain, even less than the most advantageous quantity; and I believe, the cases of too little seed being sown, are more numerous than of those where a waste of grain has been committed by sowing too much. In every calculation relative to the quantity of grain with which it may be necessary to seed an acre of land, the time of sowing should be taken into consideration, and allowance made for the unavoidable depredations which will be committed by insects, by game, and by the rest of the feathered tribe: neither must the destructive effects of a severe winter, nor the chilling blasts of March, be omitted. By the whole of these means, it is probable that one half of all the corn sown in autumn is lost; and it is evident, that corn sown in the spring, will be much less exposed to these evils; but even in the latter case, I suppose one-fourth part of the seed grain is destroyed.

Time of Sowing.—When the soil is turned over by the spade or the plough, the seeds or the plants should be inserted as soon as conveniently can be done, for the purpose of receiving the salutary effect of being in the ground while it is more than usually warm by the production of new gases.

Each day's ploughing for cole should be sown the same evening, as being well calculated to secure a quick vegetation and certain crop. This observation applies equally well

well to all spring-sown crops, but particularly well to turnips.

Water-Furrows.—Immediately after the sowing of every kind of grain, it is proper to open as many water-furrows as may be requisite to keep the land dry, by carrying off the superfluous water. And then to clear all the grassy borders from weeds and rubbish, and to make all the hedges, gates, and bars secure.

It is impossible to lay down *general* rules, that will apply with equal propriety to the minutiæ of cultivating every *variety* of soil in the most perfect manner; on the contrary, the modes of culture must be as different as the soils are various. Absolute clay, and clean sand, will of necessity require opposite management: and although there may not, perhaps, be either of these in a pure unmixed state, yet there is land in every county, and on most extensive estates, which approach so near to each of these extremes, as to obtain the names of clay and sand; the cultivators of which experience the great inconveniences attending land of these qualities. In order to till them with any degree of profit and comfort, it is clear that one rule must be adopted for clayey soils, another for sandy land; and it is equally obvious, that a third must be observed with respect to loam, or land equally between these two extremes.

Should agriculture ever be brought to such perfection, as the complete cultivation of these three kinds of soil require, it would then be an easy task to form rules for the most perfect management of all the intermediate gradations. In order to contribute my mite to so desirable a work, I shall request the reader's attention to the following remarks on the nature and management of several varieties of soil.

Loam.

Loam.—And first, of a *tenacious, cold loam*, of fro eight to eighteen inches in thickness or depth, on a su soil of yellow clay. This soil, from its retentive natu holds water, even to four times the quantity* most use to vegetation, until the joint influence of the sun and wi exhales it. A northern aspect is particularly hurtful this kind of soil, as likewise its being enclosed or surrou by woods. Low flat situations, small enclosures, a high and broad hedge-rows, especially if they abou with trees, are, separately taken, unfavourable circum stances, but any two or more of these united, greatly in crease the evil. In such cases, the nearer the topsoil a proaches to absolute clay, the less productive it will b When this kind of land happens to be so situated, th water and damp cannot be either sufficiently drained o evaporated, to prevent the redundancy of moisture fro chilling and destroying every species of cultivated cro and substituting a worthless herbage of moss, &c. Unde such circumstances, *wood* seems to be its proper appropri tion†. But when this kind of soil is situated in a mo open country, greatly or entirely exposed to the influen of the sun and wind, and on a southern aspect, it assum a different appearance, and is of a medium productivene Every intermediate situation is more or less valuable, ju in proportion as one or other of these circumstances pre vail.

With respect to the disposition and management of th soil, it is necessary to observe, that the ditches and drai should be kept open, the hedges closely clipped, and th

* Two and an half times it own weight.—*Bergman.*

† There are a few fields of a clayey soil, having a north aspect, a encircled with wood, in the parish of Cliff, a few miles from Roche (Kent), that are not worth sixpence each for any other purpose than t growth of wood.—*J. M.*

field

fields large. Few trees should stand in the hedge-rows, and those should be trimmed to the height of twenty feet above the surface, while every possible method must be taken to give free access to the rays of the sun, and current of the wind, thereby promoting a perfect drainage and evaporation. Thus circumstanced, it would make permanent pasture or meadow; and, provided it is in aration, it would be advisable to lay it down to grass with as much dispatch as is consistent with doing it clean and in good heart. This should not be done in one flat surface, as is too frequently seen, but in a gently waving ridge and furrow, the ridges being about twelve feet wide. So long as this kind of land is continued in aration, the most suitable crops for it are beans, hog pease, wheat, cabbages, oats, clover and tares. All the several operations of ploughing, harrowing, hoeing, manuring, &c. should be done, as much as possible, in dry weather, when the soil is rather disposed to crumble. It should also be ploughed, as much as can be done with convenience to the crops, into ridges of three feet in width, made up in four nine-inch furrows. Ridges of this size are general in the wet soils of Essex and Herts, and their superiority over ridges of greater breadth, for the purpose of draining the water off without washing the land, is incontrovertible.

Neither clayey-marl, nor some of the more strongly cementing-stone limes, should be applied as manures to this soil.

The occupiers of a clay soil in a state of aration, labour under many disadvantages. Their teams and implements must be stronger, more numerous, and expensive, than such as are necessary for a sandy soil. Continued wet weather puts them to considerable inconvenience, by rendering it difficult, and at times impossible, to get their land into tilth, and their seeds sown in due season. Their

labour is so much greater, and their seasons so mu shorter than is the case with the occupiers of light lar that they ought to avail themselves of every hour tha fit for their purpose.

Dibbling—will never answer in any wet, tenacious so the dibble forms a cup which holds water in wet weathe and when that is evaporated, the cup becomes as hard baked earthen-ware, impenetrable to the roots of grai therefore in either wet or dry weather, the seeds peri If this was not the case, another objection arises—from being nearly impossible, in such a soil, to cover the se properly by filling these holes with mould, though ha rowed ever so often.

Sandy Land.—The principal defect in sandy land, that of permitting the moisture to filter through it t easily*; and it is consequently very apt to be too d The dressings hereafter mentioned, as applicable to th kind of soil, are, I conceive, well calculated to reme this evil.

Very light sands will grow tares, turnips, buck-whea rye, &c. Medium sands will grow, in addition to thes barley, clover, wheat, pease, oats, potatoes, carro parsnips, &c.

On very dry light sands, it is advisable that the plou ing, harrowing, manuring, &c. should be carried on damp weather, or even in rain, particularly the last plo ing, and the sowing and harrowing in of the seed†.

* When saturated, it will only hold one-fourth of its own wei one-tenth of the quantity which a clayey soil will retain.—*Berg*

† This practice has always succeeded on a farm of dry, burni called Dunkirk, adjoining the town of Hertford. The Gloucester page 15, confirms my experience in this particular.—*J. M.*

kind of land should not be disturbed in hot seasons, more than is necessary for the purpose of destroying root-weeds, and should always be ploughed level.

The dressings and manures most proper to be used, are clayey marl, mud, loam, neat's dung, hog's dung, &c. Previous to the application of either chalk, lime, or gypsum, particular attention should be paid to the nature of the sand. If it should owe its origin to limestone, marble, shells, or other substances that admit of being burnt into lime, the addition of calcareous matter would be altogether useless. Therefore, in order to ascertain the effects which the application of these substances would produce, a cautious farmer should try the experiment on a scale so small as one cart-load.

The occupiers of light, sandy soils, have the advantage over the cultivators of clayey land, for all the purposes of aration, as they have the superior comfort of cleanliness and good roads; they are seldom put to any particular inconvenience by continued wet weather, and they are able to do their work at much less expense. They are never straitened for time to perform their operations, for they can in every season till their land, and free it from root-weeds. If they have the good sense to raise a succession of green and root crops, and feed them on the land, they may by such means always have it as rich as they please; and the modern improvements in agriculture are particularly favourable to this soil, as on it the dibbles, drills and hoes may be used in every season.

Dibbling will not form injurious cups in this land, as it does in clayey soils; but on the contrary, it will help to give firmness to a soil which is naturally too loose. And the trampling of the persons who work the dibbles, and of those who drop the seed grain, may be a real advantage to such of this land as is too light or spungy.

I shall only further observe, as to sandy land, that as trees and thick hedge-rows attract and retain the moisture of the atmosphere, and tend to counteract the ill effect of drought, all land that is naturally too dry, should be divided into small fields, of five, seven, or ten acres each, proportioning the size of such enclosures, the height and breadth of the hedges, and the figure and quantity of the plantations, to the degree of dryness*.

Medium Loam—or that kind of land which is equally between a tenacious loam and sandy land.

In cases where the soil in question approaches rather more towards a sandy soil than the above title sets forth, it would be right to connect the observations on sandy land with the following; and where it approximates more towards a tenacious loam, to connect the observations on clayey land with the following.

Ploughing and harrowing this land, should be rather avoided in wet weather, unless the crop intended to be raised should be of such a nature as to require an increase of adhesion and moisture. If this be not the case, these operations, together with hoeing, would be best performed at such time as the soil is disposed to crumble.

In ploughing land of this description, attention should be paid to the breadth of the ridges: as it tends towards sand, the flatness and width of the ridges should be increased, in order to retain the moisture; and, on the

* Calcareous sand is generally, but not invariably, favourable to agriculture; for at this time, says DENON, 'the Lybian range of mountains on the western borders of Upper Egypt, are formed of horizontal and regular strata of calcareous stones, more or less crumbling. They are in a state of being decomposed into sand, which accumulates at the foot of the rock, from whence it is driven by the winds, in such quantities as to be gradually desolating the cultivated plains.'

other

other hand, as it approaches towards clay, they should be narrower and rounder, in order to promote a more certain drainage; observing, that as sandy land should be quite flat, and clayey land, on the contrary, in ridges of three feet wide, so loam should partake of the one or other of these shapes, somewhat in the proportion as it advances towards either extreme.

This soil, even when in an exhausted state, will grow winter tares; and provided they are consumed in the field where they grow, it will then produce a crop of turnips. In case the turnips are eaten on the land, it will then be both cleansed and manured in one year, and thereby rendered fit for wheat, barley, or any other corn crop.

In cases where this land is highly conditioned, that is to say, full of manure and clean, it is calculated for the production of every species of crop, and that in abundance, with the exception, perhaps, of carrots.

Every possible variety of manure, except clayey marl, may be applied with advantage to this kind of soil.

Marsh Land—consisting of either river or sea sediment.

Land of this description should, wherever circumstances will permit, be in a state of grass; but where there is sufficient reason for its being in aration, it should not be disturbed during wet weather, though it may be worked in every season when it is dry. The ridges should be of the narrowest kind. Old pastures and meadows should only be broken up, and put into a course of aration, at such time as the herbage has become visibly impaired, which makes such an operation necessary for the purpose of restoring it. It should then be ploughed only once, which will be best performed by a trench-plough, or by two ploughs, one following the other: the first paring off

the old sward, and the other turning up the mould. Th soil is generally too deep, to place the farmer in danger turning up any soil of an inferior quality. When this done, it will, without further trouble, be in a proper stat for the reception of grass-seeds.

Peat Earth.—It often happens, that a few inches of thi soil is to be met with on loam, clay, &c. In such case, th best method is to pare and burn the topsoil; and the plough sufficiently deep to get as many inches of loam, o half as many of clay, and, after being limed, the land wi be tolerably productive.

It is also frequently found from one foot to three i depth; and may then be repeatedly ploughed, drie and burnt to ashes, until it be reduced to such a degr of thinness, as to admit of the plough turning up a fe inches of this subsoil: after being limed, it will be ve fertile.

In cases of greater depth, the first operation is to dra it completely, then the surface may be pared, ploughe or dug, and burnt into ashes. After this, it should l limed plentifully, but with discretion, which lime, a the ashes, should both lie on the surface till they and t land have been soaked once or twice with rain. It wi then frequently be advisable to sow white clover, an other grasses, without any ploughing at all; or it ma from that time be treated as arable land, consisting of rich vegetable mould, capable of producing great crops o potatoes, &c.

In cases where, from the situation of this land, it ma be capable of being flooded and laid dry at pleasure, i should be properly disposed as to shape, carriers an drains, previous to the spreading of ashes and lime; afte which, grasses and clover should be harrowed in as aforesai

I d

I do not by any means advise a total destruction of all the peat: on the contrary, it would be prudent to reserve two or three acres, on every farm that may happen to be so fortunate as to possess such a fund, for the purpose of keeping up a supply of ashes to dress the adjoining land.

SECT. II.—FALLOWING.

In the parish of Heston, where the best wheat in the county is said to have been long grown, fallowing is not in use.

In the strong-land district, westward of Harrow, where the old course, which had been established from time immemorial, included a fallow every third year, the farmers have copied the much better practice of their neighbours at Heston, and in 1796, there was only one field in Ryslip, and another in Alscot, which were in fallow. Indeed there were a few acres of land in one of the other parishes, belonging to a pupil of the old school, in what he called a fallow, though it had more than half a crop of weeds growing on it, which made it exhibit a very striking contrast to the lands of his neighbours, who had crops of pease in rows, perfectly clean, growing on theirs.

Fallowing is totally excluded from all the land south of the Colnbrook-road, and hoeing crops are generally substituted.

On the east side of the county, as at Edmonton, &c. the old course included a fallow, as before-mentioned, which, however, is now very properly beginning to make way for crops of turnips and potatoes. On the whole, I have good reason to think, that the idea of giving rest to land, is now exploded in every part of the county, except

in Ryslip and Alscot; and even there, I have not any doubt but the superior crops, and evidently higher profit, of their neighbours, will soon convince them, that the raising of clean, smothering, green crops, and feeding stock with them on the land, is not only much more profitable, as far as relates to the value of the crop substituted in lieu of a fallow, but is also a more effectual method of procuring large crops of wheat, or any other corn, which may succeed the green crop.

Before the introduction of green and root crops, fallowing was universal, and it was then, in a great measure, indispensably necessary, for the purpose of cleansing the land. All the young farmers of that time were brought up in the constant habit of seeing the weeds destroyed, and the land recruited, by means of fallowing, and they did not suppose it possible to accomplish that object in any other way. This, however, was the certain means of keeping themselves poor, and consequently their offspring ignorant, as it put it out of their power to bestow on their children a proper and useful education. Great part of the arable land of this kingdom lying in common fields, the mode of cultivating which is marked out by the law, it was of no use whatever for the farmer to attempt to vary from it. In this manner he was imperiously controuled to adopt the system of his father, till it, by the influence of *habit, became a part of his nature.* It is therefore not a matter of surprize, that farmers should have been found so peculiarly tenacious of old practices, or that there should have been so much difficulty to introduce among them new plants (as clover, turnips, &c.), new implements of husbandry (as two-horse ploughs, &c.), or new courses of crops, but more especially to do away fallowing. Farmers in general have now survived the poverty of their former situations, and their

their children, in consequence, are better instructed. The shackles and restraints of old courses, and obsolete systems, are in a great measure destroyed by reading and reflection; and *every new and promising matter on the subject of agriculture, will now receive due attention and regard.*

By fallowing, not only one year's rent, taxes, assessments, and labour, are expended, but likewise the vegetable matter contained in the soil, is rendered less fit to promote the growth of subsequent crops. Fallowing should be practised but sparingly; its only use is in occasionally destroying root-weeds and insects. These objects being attained, recourse should never be had to the same operation until root-weeds or insects have gained such possession of the land, as to make fallowing necessary for their destruction. These cases, which are supposed to render fallowing necessary, never happen to a good farmer; they only take place with the sloven, the ignoramus, and when a knave is about to quit his farm. A new tenant frequently finds, at the commencement of his term, his arable land infested with weeds, occasioned by his predecessor, who happened to be one of the foregoing bad characters. In such a case, if the land be of the clayey kind, it may be advisable to thoroughly cleanse it by a summer-fallow; but all the lighter soils may be cleared of both root and seed weeds, by a preparation for potatoes or turnips. And land of every description, which has been made thoroughly clean, may be so continued in perpetuity, without ever resorting to fallow a second time, as will be proved beyond the possibility of doubt in the next Section, on the Rotation of Crops; indeed, it may be considered as proved by the constant practice of all the kitchen gardeners, the farming gardeners, or those who till their land by the plough; the potatoe-growers; the cow-keepers, who rent arable land for

for the purpose of growing cabbages, turnips, and tares; and every farmer of any intelligence in this county.

The smothering and hoeing crops of tares, turnips, potatoes, cabbages, hemp, and other plants which cover the ground entirely, and cause a stagnation of air, preserves the moisture of the ground, and promotes the putrefaction or decomposition of vegetable matter, is infinitely more likely to prove economical and beneficial than any system of fallowing.

SECT. III.—ROTATION OF CROPS.

THE old rotation on the *east* side of the county, in the common fields which have lately been enclosed, was fallow, wheat, barley: the first of these is now giving place to clean crops of potatoes or turnips. In a few years more, I expect the second crop of corn (barley) to be superseded by clover; the rotation will then be, potatoes, wheat, clover.

In the neighbourhood of Heston and Norwood, *the course is, beans, pease, wheat; the two former twice hoed, and earthed up at the latter hoeing**.

On the *strong-land district* of common fields, between

* Of Heston, Mr. CAMDEN tells us, 'that the wheat bred there made such delicate flour, that our kings in ancient times made choice of it, particularly for their own bread, and the use of their own tables.'—*Magna Britania.*

Much of the soil at Heston, Cranford, Norwood, &c. is a most highly productive loam, possessing that happy medium of texture which fits it alike for the production of every kind of corn, pulse, and root, and its staple is five or six feet in depth, on a bed of gravel.—*J. M.*

Harrow

Harrow and Uxbridge, the former rotation was, fallow, wheat, then beans, broad-cast. But of late years it has been, beans, pease, wheat, without a fallow. The bean and pea crops are invariably grown in rows fifteen inches apart, the intervals twice hoed, the rows weeded by hand, and earthed up at the latter hoeing.

Through the *light-land district* of common fields, between Longford and Sunbury, the arable land is usually cropped in the following way: viz. wheat, barley, hog-pease, in rows, twice hoed; a few acres of beans, and two or three acres of tares. Then wheat, barley, and, lastly, clover; which is mown twice, and coming only once in six years, is generally a great crop. But four corn crops in six years, are too severe for this, or almost any other land; especially as part of the hay and straw is sent to the London, and other markets, from every part of this district. On the other hand, it must be owned, that the quantity of dung collected from the inns, at Brentford, Hounslow, Stains, and other places, is so very considerable, that it will assist in supporting the land under this great degree of exhaustion.

In this tract of land, the ridges are generally from ten to twenty yards in width.

The rotation of crops in the district of Chiswick, is, the first year, vetches for spring feed, white pease in rows, to be gathered green; then turnips or potatoes: the turnips are not fed, but sold to, and drawn by, the London cow-keepers; the second year wheat, and the third year barley, or oats. But before the pulse are sown, and also before the root crops are planted, the land is well manured. The farmers of this district say they cannot grow clover, on account of the Lammas tenure incident to common fields; but those of Shepperton, Sunbury, and Littleton, show us that clover may be grown even in common

mon fields, though only to such a small extent as they are able to cover it with litter, in order to preserve it from the bite of sheep. (See Clover).

In the district of South Mims, which consists of a wet soil, or thin cold clay, the system of husbandry is, 1st, summer-fallow; 2d, wheat; 3d, beans, horn grey pease, or oats; manure well after; then, 4th, summer-fallow. On the lighter and better parts, bordering on North Mims (Herts), 1st, turnips, on a summer-fallow; 2d, barley, with broad clover.

Mr. HUTCHENS, of Earl's Court, and the other farming gardeners at Kensington, Fulham, and other places, raise a succession of, first, cabbages; secondly, either potatoes or turnips; and thirdly, wheat every two years. In this case, though there is no fallow, their land is kept as clean, and nearly as rich, as a good kitchen-garden. Some of them have adopted the following valuable rotation, namely, they manure heavily a clover lay for,

1. Potatoes,
2. Wheat,
3. Clover;

and successively repeat the same rotation. The potatoe crop is the cleansing one; the roots are taken up with three-tined forks (dung-forks), the haulm is got off, and used in covering the pies, and littering the farm-yards. The rubbish is then harrowed out, raked together, and carried off: in this state the land is sown with wheat, which is covered by a thin ploughing; which is all the tillage it receives, except for the potatoes. The crops are all great.

The first is from seven to ten tons.

The second is about forty bushels.

The third, four tons of hay at two cuttings.

Mr. GREENHILL, of Stratford, in Essex, on the border of this county, is said to have repeatedly had 600 acres

acres of each of these crops in one year. That invaluable rotation enabled him to accumulate a very large fortune. I understand one of his younger sons is at this time continuing the same rotation, and I hope with similar success.

The *rotation of crops* is the most important subject that can occupy the attention, or exercise the ingenuity and skill, not only of an agriculturist, but of man. It has hitherto been too little attended to by almost every cultivator, but I hope it will now receive that consideration and attention which its high importance so justly claims. The Board of Agriculture is very likely to become the means of collecting the practice of such benefactors to mankind as Mr. GREENHILL and Mr. HUTCHENS, and of disseminating the superior excellency of their system, which only wants to be known, in order to be speedily adopted by the more enlightened members of the agricultural world. Their example will be followed by every farmer of a sound understanding; and from that source will certainly result greater benefits to this nation, than ever was rendered to any people by all the politicians that ever lived.

The aggregate benefits that will be derived to the country from this measure, are not to be estimated: but among the first of these, will stand *the abolition of fallows*, and the introduction of *green and root crops* to supply their place, over an extent of *about three or four million acres of arable land.* So far as tares and turnips; or tares and potatoes; or pease and turnips; or pease and potatoes; or cabbages and turnips; or cabbages and potatoes; or any other *two good crops*, can be raised in one year, in place of a fallow, the produce of all the arable land in the nation will be *double* in quantity, what it has been under the former system.

There

There are about nine million acres in England and Wales, in the course of two crops and a fallow; that is, six in crop and three in fallow. Hence it follows, that by procuring *one* crop in lieu of the fallow, fifty per cent. is added to the former produce. But so far as *two* crops can be obtained, in place of a fallow, it adds 100 per cent. to the former number of acres of produce. Consequently, abolishing fallow, and obtaining two crops in lieu of it, would add the produce of six million acres to our former supply. This is only a part of the benefits which improved agriculture is capable of bestowing on mankind. The Stratford rotation of potatoes, wheat, and clover, every three years, may be followed on any of the lighter soils that are near a market town, and not in common fields, and it is calculated to support a vastly increased population. The rotation of tares, turnips, wheat, and clover, in three years, may with equal ease be practised in places more distant from dunghills, and in any soil that is not in common fields, and it would support a vastly increased number of cattle. The Kensington rotation of cabbages, to be succeeded by potatoes or turnips in one year, wheat the second year, and clover the third year, may be raised adjoining any considerable town, and there disposed of, and it is capable of maintaining great numbers of both cattle and people.

In general, a well-selected rotation of crops is capable of doubling the population, and vastly increasing the wealth and resources of the British Nation.

The farmers of Heston and Norwood also have much merit, in setting an example to their brethren, of *good farming, in taking two green and hoeing crops to one crop of corn.* It is from such close attention to the clean cultivation of their land, and from their preserving its vigour, by growing only one corn crop in three years, that the

corn

corn produced in that district is so much superior to that of others. It is not only of the first quality, and fetches the highest price, but it has gained a name, and is therefore more in esteem than any other in the county. This is now no longer the practice of a farm or two, but of a district that has, within the last twelve years, extended itself over most of the strong land between Uxbridge and Harrow, an extent of many thousand acres.

A perfect system of husbandry is not possible in common fields, from the circumstance of the almost total exclusion of winter tares, cole, turnips, and clover. Where the rotation of crops is very imperfect in any part of this county, it is evidently to be attributed to the arable fields being in common, and an effectual remedy can only be found in the enclosure of all such fields. Till this is effected, it would be an improvement to pursue the following method, namely, the first year barley; second year clover, at least on as great a portion of land as litter sufficient can be got to spread over it; the rest, white pease, in rows, twice hoed, earthed up at the latter hoeing, and hand-weeded; third year, wheat; fourth, potatoes or spring tares. The potatoes should, in this case, be planted sufficiently early to admit of being taken up soon after the time of turning cattle into the fields. This land being near the *London dunghills*, with the advantage of water carriage, there is no doubt but that, with a liberal supply from *them*, it would bear these crops well. But any thing short of the enclosure of all common arable land, should not be listened to, not even for a moment.

Corn unquestionably exhausts the fertility of land in a very great degree; of course, an unremitting continuance of corn crops would necessarily destroy the fertilizing principles of the best land; and hence it follows, that the poverty of any soil is in proportion to the number

ber of corn crops it has produced in a given time. The great evil is, that ordinary farmers are particularly anxious to have as much as possible of their land in corn. Many of them sow wheat, even during so long a time as the land will return a crop equal to the seed sown: then barley, and afterwards oats, in constant succession, till the land, wearied out and exhausted by such treatment, is rendered incapable of growing any thing but weeds. It is then suffered to rest, and when it has in some measure recovered itself, by the influence of the atmosphere, and by the dung of young stock, which its worthless herbage barely keep from starving, it is, towards the conclusion of their leases, again subjected to the scourge of corn growing, without mercy*.

The printed Reports of the several Counties, evidently point out the poverty and wretchedness consequent on an exhausting course of crops; which must arise from the mistaken rapacity of the tenants, on the one hand, and the neglect of the landlord, on the other. Indeed, most of the ley land of this island exhibits a picture of starvation, in consequence of its having been cropped with corn so long as it could bear any.

Throughout the West and North of England, the farmers are too generally negligent in arranging their course of crops, with the exception of a few solitary instances, one of which is the northern management of turnips and potatoes, which may be highly commended. A landlord giving his consent that a farmer shall plough up any particular field of grass-land, may very generally be considered as signing its death-warrant

* These observations are intended by me to apply to the farmers of other counties, not to those of Middlesex.—*J. M.*

previous

previous to delivering it over to the hands of the executioner*.

In corroboration of my own experience as to these facts, permit me to quote a passage or two from the Reports of the Welsh counties:

'The Anglesea method of cropping land, naturally extremely fertile, with wheat and barley alternately, brought on the necessity of giving up wheat: barley and oats were next grown alternately, which in a short time sickened the land of barley. Then, as a last resource, oats after oats, till it would not bear them. This county has in general been thus left to keep some young cattle from starving; and the inhabitants, in their turns, are as impoverished as the land. Indeed it was to be expected, and they have literally exchanged or given the wheaten loaf for the barley or oaten cake.'

Mr. HASSELL also, in his Report of Carmarthen, says, 'that the people have impoverished the soil; and the soil, in its turn, has impoverished them, and amply revenged the wrongs it suffered by the farmers. Put a sloven upon ever so rich a soil, in ever so good condition, let him impoverish his farm, and I will answer for it, the farm will pay him back in his own coin, and impoverish him, unless he runs away from it.'

'Leaving farmers at liberty to crop their ground, every farmer after his own manner, would most rapidly reduce all the land in Great Britain to a similar state of wretched poverty.'—*Carnarvon*, p. 12.

---

* 'Nor is the land sown with artificial grasses till it is no longer able to bear corn.'—*Somerset*, p. 75.

'Ten successive corn crops.'—*Wilts*, p. 65.

See also Worcester, Appendix, p. 13; Carmarthen, p. 12; Cardigan, p. 10; and Radnor, p. 13.—*J. M.*

A few instances of good farmers acting in oppositi to a general spirit of deterioration, would have very litt effect.

Land under common circumstances, will not ev bear, without injury, a corn crop once in two years. A the accounts of Norfolk are uniform in saying, th turnips are less certain, and much lighter, than th used to be. The same observation applies to clover, a probably to the crops of corn. This falling off in the p duce, proves that their rotation is rather more than t land can sustain, which is gradually suffering under t great a degree of exhaustion. Even with the assistan of extensive sheep-walks, the soil is not able to bear t against the weight of its present course of crops. B when a five or six years' course is erroneously adopte by introducing barley after wheat, the ruin of the land certain.

The interests of the community, and the landlord, a permanent and similar; while those of the tenant a temporary, and consequently in opposition to the forme The very nature of the tenant's precarious interest in th soil, is powerfully calculated to impel him to draw th most he can from the land during his lease; and whic can only be done, by cropping it in a way that it cann possibly sustain in perpetuity. To this source we m undoubtedly trace the cause of the poor and exhaust state of many farms, at the expiration of the leases, every part of the kingdom.

When the commons, downs, and sheep-walks, a enclosed and cultivated (as in a few years they must b the old enclosed lands will, in consequence, be depriv of the manure deposited in the sheep-folds, which th now derive from those wastes. It will then be fou

t

that *the wiser way will be, to grow two green or root crops for one of corn.* Indeed, after having given the rotation of crops much consideration, the result is a settled conviction, that on every description of soil, *this* would be the best practice.

Agreeably to this system, suppose it was required to break up any old pasture, and lay it down again improved, after it had yielded three crops of corn.

First, for a coarse old Pasture, on a Soil that is suitable for Barley.

The first year.—Pare and burn the turf, plough the land, and sow turnips, to be eaten on the same land by sheep during the following autumn and winter.

The second year.—Sow wheat from time to time, as early as the land may happen to be got into good tilth, during the months of November, December, February, and till the middle of March; and on such parts of it as cannot be got ready so early, sow barley. After these crops are reaped, plough the land without loss of time, and sow it with winter tares.

The third year.—Mow the tares, and give them three or four times daily, in racks, cribs, or cradles, to sheep, and other cattle, on the land where they were grown, and as they are consumed, prepare the soil with all possible dispatch, and sow turnips, to be eaten on the same land by sheep.

The fourth year.—Wheat or barley, to be succeeded by tares, the same in every particular as I have described for the second year.

The fifth year.—Tares, to be succeeded by turnips, as in the third year.

The sixth year.—Barley, with much white clover, and

a small quantity of the sweetest perennial ray-grass, wi or without other grass-seeds to continue.

Secondly, for a coarse old Pasture, on a Soil of medium or stro Loam.

The first year.—Pare and burn the turf, plough in tl ashes, and sow turnips in rows made across the ridge during the following autumn and winter, feed the who on the same land, if the season favour the soil, or fe as many of them as the season and dryness of the soil w permit; then split the residue, and let them rot on the la for manure; or cole may be cultivated in lieu of eith the whole or a part of the turnips, and in the same ma ner, for sheep food.

The second year.—Wheat, barley, or oats, to be suc ceeded by winter tares, in every particular the same as have described for the second year on a soil that is suit able for barley.

The third year.—Fatten your flocks of sheep, and othe cattle, with the tares as before described; and as the are consumed, prepare the soil, and sow either turnips o cole in rows across the ridges, to be served as mentione the first year.

The fourth year.—Wheat, barley, or oats, to be suc ceeded by winter tares, the same as in the second year.

The fifth year.—Tares, to be succeeded by turnips c cole, as in the third year.

The sixth year.—Barley, on so much of the land may happen to be in fine tilth, and oats on the residu with a large portion of white clover, some of the best ra grass, and other grasses, to continue.

Thirdly, the Universal Rotation.

The first year.—If the land be already in aration, fa lo

low and manure it for turnips or cole; if it be in grass, pare and burn the turf, plough in the ashes, and sow turnips or cole; in every case for being eaten on the same land, when the season will permit, and by splitting, aided by frost, rot the remainder for manure.

The second year.—Sow wheat from time to time, as early as the land becomes cleared of the turnips or cole, and can be ploughed once tolerably dry during the months of November, December, February, and till the middle of March; and on such parts of it as cannot be got ready so early, but which may happen to be in fine tilth, sow barley, and, on the residue, oats. After these crops are reaped, plough the land, and sow winter tares without loss of time.

The third year.—Mow and serve the tares to sheep, and other cattle, and then prepare the soil according to its nature, in point of being dry or wet, either on the flat or in rows, and sow turnips or cole, to be eaten or rotted as aforesaid.

The fourth year.—Corn, to be succeeded by winter tares, as in the second year.

The fifth year.—Cultivate the two green crops, and consume them on the land, as in the third year.

The sixth year.—Corn sown in the winter and spring, to be succeeded by tares in the autumn, as in the second and fourth years.

Seventh year.—The same as the fifth.

As it will not always be possible to eat the whole of the tares on the land by cattle and sheep while they are green, the residue of them may be mown and made into hay, and a sufficient quantity of them may be saved for seed.

This succession of two green crops and one corn crop, may be continued for any length of time: the whole rotation, consisting of three crops, may be obtained every

two years. On this system, the land will always be clea and full of animal manure, capable of being laid down t grass at a moment's notice, or of being continued in ara tion for ever. One moiety of every farm may, in thi manner, annually bear corn for the sustenance of man and the other moiety may bring to perfection two gree crops, which will support herds of neat cattle, and lar flocks of sheep.

This system admits of being universally applied. It capable of doubling the present agricultural produce, that circumstance would increase the number of inha tants in the same degree.

This rotation is the more valuable, as it admits of veral variations without materially deranging the syst Thus, for instance, potatoes might be planted occasion in lieu of the turnips; and various plants of the cole cabbage tribe might at times be introduced, instead either the winter tares or the turnips. Also variati might be created by occasionally adding clover after t corn, in which case the rotation would stand thus: t first year tares and turnips; the second year corn, a the third clover. The last is vastly superior to any rot tion now in use, but it would exclude the plough for on year and a half, and by that means encourage the growt of weeds; whereas, the rotation of tares, turnips, an corn every two years, requires the cleansing operations o the plough and the harrows every half year. Consequently, it is as well calculated to annihilate weeds, as to double the quantity of provision, and the number of our inhabitants.

The influence of provision on the number of inhabitants, will be illustrated in the Section on Population.

I shall now take the liberty of offering to the attention and consideration of farmers (especially of land that is suitable

able for barley), the following crops, nearly in the order in which I have placed them, and *as calculated to supply a continued succession of green food, of the best quality, in abundance all the year round*, namely,

Water-meadows,
Ray-grass,
Rye, cut green,
Winter tares,
Clover, the first crop,
Spring tares,
Clover, the second crop,
After-grass of meadows; clovers, and seeds of all sorts,
Turnips,
Potatoes,
Cabbages, Savoys,
Cole, green boor-cole, and purple boor-cole,
Swedish turnips,
Turnip-rooted cabbage*,
Kolrabi.

As auxiliaries may be added, bran, pollard, oil-cake, linseed, &c.

Whoever will attend to the raising of the foregoing crops, on a scale proportioned to the size of his farm, and the number of his *live stock*, need not be straitened from want of food for *them*, at any time or season of the year. It is evident on a bare inspection of the list, and, considering the properties of the different plants, and the seasons when each of them are the most fit for use, they complete the circle of the year. It may perhaps be started as an objection, that many farms are without water-meadow;

* Report of Kent, page 104; Report of Gloucester, page 28; and Transactions of Society of Arts, &c. vols. i. ii. iii. iv. vi. vii.

very true; but then cole, Swedish turnip, and turnip-rooted cabbage, might be produced in such quantity as to be sufficient for consumption in March and April, during which months, and part of May, they are in the highest state of perfection. These might be assisted, or even superseded, by turnips, potatoes, carrots, parsnips, and even cabbages, all of which being gathered while in the greatest perfection, might be laid up in store pies, either with or without frost or snow, for spring use*. Water-meadows afford a vast deal of food from the middle of March†; ray-grass from the first of April; rye from the beginning of May; winter tares soon follow; then comes clover, the first crop; spring tares; clover the second crop; and the after-grass of natural meadows, clover, &c. which will continue in perfection for heavy cattle till early-sown turnips are ready. Late sown turnips and cabbages will be sufficient till the end of February, without storing; about which time the cole, Swedish turnip, and turnip-rooted cabbage, will come in, and continue good through March and April, and even May, if needful. All these, more than complete the circle of the year‡.

SECT. IV.—CROPS COMMONLY CULTIVATED.

THE corn cultivated in this county, is nearly confined to wheat and barley; rye and oats are grown only in very small quantities.

* It is presumed that these roots, &c. might be preserved in pies, among ice and snow, until late in the spring, then thawed in cold water, and used.—*J. M.*

† See Report of Wilts, by Mr. DAVIS.

‡ The foregoing system entirely removes the time of scarcity with improvident farmers, between winter and summer.—*J. M.*

The

The green and root crops commonly cultivated by the farmers in Middlesex, consist of a very considerable variety, viz. beans, pease, turnips, cabbages, white clover, red or broad clover, cow-grass, red honey-suckle clover, ray-grass, rye cut green, tares, barley and oats mixed with tares, for the use of cattle; turnips, potatoes, carrots, parsnips, green-pease, and beans, for the use of man. Lucern and buck-wheat are occasionally grown, though on a very small scale. No instances of the cultivation of hemp, flax, rape, turnip-rooted cabbage, sainfoin, chicory, burnet, meadow soft grass, ribwort, timothy, &c. within this county, have come to my knowledge.

An extensive cultivation of the foregoing crops for the use of cattle, is the most powerful of all means that can be devised, for the support of an increased quantity of live stock; the cheapest and readiest way of raising mountains of manure; and, of course, the most certain means of enriching the land, which generally makes wealthy farmers.

The vicinity of the London markets certainly renders potatoes, carrots, and parsnips, too valuable in this county, to be profitably employed in the feeding of cattle; but in places more distant from the metropolis, where these roots sell for little money, they might be advantageously cultivated for the use of cattle; and, being added to the foregoing list of green crops, stated to be grown in this county for that purpose, they would make four green crops to one of corn; that is, if they were grown in such a manner as to include the whole.

Changing the seed of corn every two or three years, is a practice which prevails almost generally. It is done at an extra expense of from sixpence to one shilling a bushel on wheat, and half those sums on other grain. This practice is as little founded on propriety, as a change of live stock once in every two generations would be, and *never will be*

the

the means of advancing corn to a high pitch of excellence. On the contrary, when corn farmers become wise enough to apply BAKEWELL'S *method of improving cattle, to the raising of seed grain, the advance will be rapid indeed,* and its improvement will go on towards the mark of perfection, in a degree which, in the present state of things, can scarcely be conceived.

The method I wish to recommend to those cultivators who desire to excel in the article of grain, is the following, namely, a few days before harvest, to walk through their fields of corn, to select and gather the prime samples of every species of seed, and ever afterwards to continue the same practice, by repeating the operation of *collecting the most perfect grain from the crops produced from such selected seed.*

The same observations apply to every variety of cultivated crop.

I. WHEAT.

When this Work was first sent to the press, there were about 7000 acres of land annually cropped with wheat in this county; which quantity has been increased since that time to 10,000, by enclosing some of the commons.

1. *Preparation.*—Immediately after the land in this county is cleared from the previous crop of beans, pease, or tares, it is ploughed as shallow as possible; the roots and weeds are then harrowed out, raked together, placed in heaps, and burned. And soon afterwards it is re-ploughed a few inches deeper, into proper ridges for the reception of the seed. When the soil is clean and in proper tilth, this is so good a preparation that nothing more

is

is necessary. But it sometimes happens to clayey soils in wet seasons, that such tillage does not reduce it into a fine and satisfactory state: in that case, it is usual to harrow after the second ploughing, and re-plough the land with a thin and narrow furrow a third time. The seed is frequently sown immediately before such third ploughing, and covered by it. It is rather a general practice, for half the seed of wheat to be turned in by the second or third ploughing, and for the other to be afterwards harrowed in. There are some few negligent persons who plough only once*.

When wheat is sown after clover, the ground is ploughed only once, in doing which, the more intelligent farmers make use of what is called a skim coulter†, which places

* A Correspondent of the Board writes thus: 'The farmers in the neighbourhood of Ryslip and Pinner, seldom if ever plough their land over-athwart, and for want of so doing, they rarely obtain a good sweet tilth to sow their wheat in. And that they do not cut water-furrows sufficient across their heavy clay lands, to take the water quite off the wheat, &c.'—This is the necessary consequence of the land lying in common fields, as it is well known the farmer cannot *cross plough* his land without drawing over his neighbour's land, which he is not entitled to do; and the same obstacle prevents the water-furrowing from being properly executed, as the farmer cannot extend it beyond his own land. In the enclosures, ploughing and water-furrowing are, for the most part, well managed.—*J. M.*

† That is, a common coulter, with a fin and turnplate rivetted or screwed to the off-side of it, about four or five inches above its point. Thus equipped, the coulter skims off the remains of the clover and grass, and turns it into the bottom of the furrow; the plough instantly follows, and covers it in. The field being ploughed in this manner, looks cleaner, and harrows much better than it does when ploughed in the usual way. An adequate idea of this operation may be formed, by comparing it with a trench-plough, or two ploughs following each other in exactly the same tract, as the effect would be the same. In every case of this kind, when the plough turns up a sufficient quantity of mould, it will smother the weeds, and leave the land clean.—*J. M.*

the

the grass and weeds at the bottom of the furrows, where many of them are smothered.

This operation prepares the soil in a superior manner for being harrowed, and makes it look clean, although it may not be so. A more effectual way in this case would be, to give the clover ley one trench-ploughing. In point of good husbandry, when clover leaves land foul, it should either be trench-ploughed, or wheat should not be sown, but some cleansing crop instead of it. Wheat sown in autumn occupies the land about ten months, which length of time is fully sufficient to enable such weeds as may happen to be in the soil, to mature their seeds, and by that means, and the increase of perennial roots, multiply their number a hundred-fold. Therefore, in order to avoid so great a mischief, no other land than such as is absolutely clean, should be sown with wheat in autumn: this is a good reason in favour of sowing such grain in February or March.

The old doctrine of fallowing and manuring for a wheat crop, which, at one time, almost universally prevailed, is now justly exploded; and the much better practice of sowing wheat after a *clean* crop of beans, pease, tares, rape, hemp, flax, potatoes, turnips, or clover, now prevails with every man of superior skill in agriculture.

Wheat should never be sown after rye, barley, or oats; nor should the land be manured from the farm-yard for this crop.

Some rubly chalk-hills, loose sand, or spungy peat-earth, can only be rendered fit for wheat, by folding sheep on the land immediately after putting in the seed grain; or by the trampling which takes place on dibbling in the seed.

The best of all known preparations of the soil for the growth of corn is, previously to raise a large crop of winter

tares,

tares, and give them to sheep and other cattle where they were grown; then a crop of turnips or cole, and consume them in like manner on the same land: if the soil be perfectly tilled for these two crops, it will be certainly freed from weeds, and well supplied with animal manure; in which case it will want only one ploughing to prepare it for receiving the seed grain early in the spring. This should be done during every dry time in winter and spring, as soon as may be after the land has become cleared from the turnips. Those persons who sow wheat in autumn, lose the great advantage of the previous crops (mostly of the tares, but always of the turnips), both as to destroying weeds, fattening cattle, and manuring the soil.

2. *Sort.*—New grain recently thrashed, is generally preferred for seed; though some few persons give the preference to wheat of one year old, in order to be more sure of sowing such corn as has become cleared from the eggs of the red-gum and smut insects, by the length of time which it has been kept.

Thin skinned grain is supposed to yield the most meal, and therefore wheat possessing that quality, and weighing the greatest number of pounds to the bushel, is in the most esteem, and will sell for the highest price, whether red or white. Mr. Boys, who is excellent authority in a case of this kind, recommends the velvet-eared white wheat, as by far the most valuable, because it is very productive, and the best for the use of the miller. The straw is white and short, the chaff covered with a thick fine down, rather of a brownish hue, the grains remarkably small, and of a dull white colour, and the bran so very thin, that some grains are almost transparent. It grinds very mellow, into a beautifully fine white flour. The nonpareil wheat has a bright straw, with a brown ear, and grain that is white, large,

large, and plump. It is very productive on all soils; thrashes freely, and yields in that operation the greater part of its chaff, by which it produces a great quantity of meat for horses. This sort also grinds mellow, and is well esteemed by the millers.

"A bushel weighing 62lb. is supposed to contain about 515,000 grains of seed."

3. *Steeping.*—Both brine, and urine mixed with lime, are used for this purpose.

The *red-gum* on wheat, is a collection of insects, visible to the unassisted eye, and which, in the early part of their growth, are of a reddish colour, but become brown with age: the black spots on the straw, blades, and ears of wheat, are supposed to be the excrement of the insects. The blighted ears are probably rendered so by the insects piercing the neck of the straw immediately below the ears, and sucking the saccharine juice, otherwise destined for filling the corn. In those ears which have both perfect and imperfect grains, the insect has inserted its probe at the connexion between the corn and the straw, and by drinking the food of the grains severally, has starved many of them to death.

Smut, in like manner, is most probably occasioned by a very small insect, or animalculæ, which consumes the inside of the grain, leaving the skin full of their dung, in a state of powder of a black colour.

These two kinds of disease are propagated by two different species of insects, which are supposed to lay their eggs on the sound corn, and are committed to the ground with the seed. The warmth of the following summer, by hatching the eggs, brings myriads of them into existence; they ascend the seedling stems of the corn, and in this manner a new generation of the same species of insect commits

commits its annual depredations on the growing wheat, the bad effects of which may be prevented by washing the seed-grain in two, three, or more, waters, till it be cleansed from the eggs of these insects, and in that manner prevent their being carried to the land*. But an easier, and, in some respects, a more certain, method, and which I recommend from my own practice, is, by putting chalk-lime, recently burnt, into a copper of boiling water, and as soon as the former becomes dissolved, pouring the mixture at this degree of heat on the wheat, previously spread on a stone floor, immediately turning the wheat and the mixture well together with shovels. This may be done over night, and the seed sown the next day; or it may be done just before sowing; though I have known seed thus prepared, remain a week before it was sown, without injury. *The heat of the water, aided by the caustic quality of the lime, and the suffocating smell of the fixed air then discharging from it, seems to be sufficient to destroy the animalculæ and their eggs, and also to coat the wheat so as to become a preservative from vermin.*

For further reasons in favour of steeping seed-grain, see page 141.

Blight, or mildew, is wholly different from smut, and is occasioned by some baneful influence on the plant in its growing state. This may be brought on at any period of its growth, by a sudden and extraordinary change in the atmosphere. A hot day succeeding a cold night, is abundantly sufficient to produce such a disease. In all the early stages of its growth, wheat is in a grassy state, and safely recovers from the checks which it then re-

* See Communications to the Board of Agriculture, vol. ii. and the volume of Transactions of the Society of Arts, &c.

ceives;

ceives; but when it makes its principal shoot, previously to producing its blossom, it grows as much in three days as it does at any other period in a month; and in this state of growing several inches per day, it must of necessity be so tender, as to be sensible of every change in the atmosphere; consequently, it is then in a state of the most danger; it is also subject to much risk during the time it is in blossom, but the hazard grows continually less towards the approach of harvest.

Every extreme in the state of the elements is injurious to the growing crop; weather moderately dry is most favourable to a great produce. I have known extensive mischief done to the growing wheat, by an unusually dry fortnight before harvest; and it is well known, that too much rain at such a time, beats down and spoils the corn.

4. *Seed.*—The quantity generally sown on an acre, is nearly three bushels.

The quantity of seed, however, should vary somewhat with the quality of the land, and the time of sowing; a poor soil requiring more seed than a rich one, and a late season requiring more seed than early sowing. On every kind of land, the broad-cast method requires a larger quantity of seed than if it were drilled. At Michaelmas, two bushels and an half of seed is an advantageous quantity for sowing broad-cast on a medium soil, and to this add two quarts of seed for every week later. Wheat sown broad-cast in February or March, on a clean and rich soil, should probably be at the rate of nearly four bushels per acre.

5. *Time of Sowing.*—It is usually sown during the months of October, November, and December; in the order

order in which the land is got ready; though the greatest breadth is sown in the month of October. In the case of sowing it after turnips, it is sometimes sown so late as February and March; but October is thought, by the farmers of this county, to be the most promising season, and that all the land which is then ready, ought to be sown *†.

Those persons who sow wheat in autumn, lose the great advantage of a previous crop of turnips, both as to destroying the weeds, and manuring the soil; and they create the labour of either hoeing, harrowing, or otherwise tampering with the weeds and young wheat in the following spring. A wet seed-time, sometimes renders it impossible for the farmer of a clayey soil to sow his usual quantity of wheat in autumn; this ought not to induce him to sow his grain when the land is too wet for the occasion, but rather let him wait till the first favourable opportunity in the months of February or March, by which time frost will have rendered the land mellow, and then he should sow the residue of his wheat; as the probability is great, that wheat sown on a mellow soil, in a dry February, will be more productive than if it had been sown on the same land, in an adhesive state, during a wet November.

Autumnal-sown wheat precludes cultivation for one entire year, which, apart from all other circumstances, gives great encouragement to the growth of weeds; but in order to appreciate the great mischief done by sowing

* 'Twenty acres sown the middle of March, 1796, after turnips were carried off, turned out a good crop—sort, the red chaff, with white grain. —*Mr. Jenkins.*

† 'Seven acres sown the last week in February 1796, after turnips and pease the preceding year, yielded twenty bushels per acre.'—*Mr. Hood.*

wheat in that season, its connexion with the usu
tion of crops must be taken into consideration.
stance, first, in the ancient, and still very comm
tation of fallow, wheat, oats, there seldom is any
ing from the sowing of the wheat till the sowing
oats, which is one year and a half; secondly, in
tation of wheat, clover, spring corn, or pulse, th
two years together in which the plough cannot
be put into the ground; thirdly, in the valuable
of turnips, barley, clover, wheat, the plough is s
of the ground for two years and a half. These
cases include most of the arable land in Britain, a
demonstrate the prodigious encouragement whic
rotations give to the growth of weeds. On the othe
wheat sown in the spring occupies the ground onl
year; and when that is placed in a succession with
tares and turnips every two years, the weeds ha
time to grow in such a manner as to do any mate
jury. There is no period in such a rotation, of mo
six months in summer, or eight in the winter, fre
the operation of the plough. This degree of tilt
the land free from weeds, and, in that manner, pr
it from being exhausted by them; and, by givi
green and root crops to sheep, and other cattle,
land, it becomes doubly manured every other year,
cannot fail to force the growth of the wheat as th
were growing in a hot-bed.

It certainly is not in every possible case advis
refrain from sowing wheat in the autumn, in o
sow it in the spring. A dry seed-time is of so mu
portance to the occupiers of adhesive and fenny soil
they ought not to let any such time pass without
their grain. In the case of a dry autumn, which
same thing as a fine seed-time, the farmers should

such land as is then ready, and thereby ensure the important points of a good seed-bed for their grain, and against the danger of a wet spring. On the other side, the more rain that falls in autumn, the better chance there is of having a dry spring; and consequently, in every wet autumn, I advise my readers to postpone sowing their wheat till the spring. If this advice had been largely acted on in the autumn of the year 1799, and the spring of 1800, this nation would have escaped most of the melancholy effects of the dearth which followed the defective crops of the summer in the latter year. Proof of the success of one instance of this kind, will enable my readers to judge what great things may be effected, even in an unfavourable latitude, by patience in wet weather, and exertion in dry. Mr. BROWN, of Markle, near Haddington, Scotland, owing to the wet autumn in the year 1799, delayed sowing his wheat till after the 19th day of February 1800; between that time and the middle of March, he seeded 145 acres with wheat, principally the Essex white and Egyptian red. His harvest was about ten days later than usual, and the crop yielded from 24 to 40 bushels (Winchester) per acre, which weighed nearly 62 lbs. each. I examined this wheat, and sincerely declare, it was a first-rate sample.

So successful a case of raising fine wheat from grain sown in the spring, and in Scotland, may probably be sufficient proof of its being possible to grow similar crops in England. I have at various places seen many closes of it, and have never known it fail, when sown early, and on land in good heart. The advantages of sowing wheat in the spring, are so many and considerable, as will be proved hereafter, that a much less crop from grain sown in the spring, will yield as much net profit as a larger produce from the same land sown in autumn.

In case a farmer should be desirous of sowing later than the middle of March, he should not depend on such grain as is usually sown in autumn, but resort to the true Siberian, or summer wheat. This species of wheat has been sown in England, with various success, during the months of March and April, and even so late as the 10th day of May.

An intelligent farmer who should succeed on a large scale, in the rotation of tares, turnips, or cole and corn in two years, would never afterwards be satisfied with small crops, nor even with medium returns; he would be convinced, that following such a course would obtain for him abundance. Two good crops, employed in the fattening of animals on the land, are calculated to ensure one immense crop of corn. Largeness of crop seems to be of more consequence than the species of grain; but I should prefer sowing wheat on all land ready for seed before the middle of March; and after that time, the nature and condition of the soil, together with the season, in point of being dry or wet, early or late, should determine me as to the choice of sowing barley or oats.

Wheat sown in autumn is exposed to the depredations of slugs and worms, which are very destructive during a wet winter; and when that is followed by a dry spring, the surface of strong land becomes so hard, as to render the crop sickly. This, as well as the exposure of the roots of wheat, brought on by much frost and wind in winter, our better-informed farmers endeavour to remove, by hand-hoeing, harrowing, sowing top-dressings, and rolling; all which depredation, disease, and expensive operations, may be wholly avoided by sowing wheat in the spring.

6. *Culture while growing.*—In the spring, much of it is hoed,

hoed, the thistles cut out by hooks, and when black grass abounds, it is sometimes drawn up by hand.

When a dry spring succeeds a wet winter, it makes the surface of strong land *so very hard, as to prevent the new and uppermost (coronal) roots of the corn from freely penetrating into the soil.* This is discovered by the corn turning of a sickly yellow, which may, and ought to be, *prevented by harrowing once or twice in a place*, and immediately either rolling, or driving a flock of sheep about, until they have trodden the roots of the plants into the mould raised by the harrows; and in the unfortunate case of the plants being so thin upon the ground as to admit of hand-hoeing, it ought not to be neglected. The good effects of harrowing and rolling autumnal-sown wheat during a dry spring, is obviously to open the soil between the plants: earth them up, break the clods, and close the mould about their roots; and the same operation is generally advisable, on the sowing clover or grasses among wheat, to ensure their vegetating.

In case it be suspected that the land is *not sufficiently rich* to bring a full crop to perfection, *sow top-dressings, or shower it with the drainings of dunghills*, and immediately after harrow and roll. Let this be done as early in the spring as the land is sufficiently dry to bear the treading of horses without poaching.

When worms or slugs are perceived to attack wheat, it is usual to turn a flock of sheep into the close, and some persons send a boy with a dog to drive them about, in order to tread many of the vermin to death, and to fix many more of them in the ground to perish. In this case, soot, sown over the young wheat, has been known to have a good effect.

After a frosty winter, the *seminal roots* of wheat are sometimes exposed for two or three inches in length above

the mould; in that case, turning sheep in after a moderate shower, and driving them about, will tread the wheat into the moist ground, where some of it will abide, and the crop be preserved by the production of coronal roots.

This defect only happens on land that was in fine tilth at seed-time, and is another objection against sowing wheat in the autumn. It is a complaint which never takes place on such land as is sown in the spring, or that is cloddy at seed-time; for on rough ground, the seed falls between the clods, and as they become shivered in winter by frost, they moulder down, and on being harrowed in the spring, they become completely reduced, and spread among the wheat in the most beneficial manner.

On strong loams and clayey soils, if they are ever so clean, and on all lands that are foul with root-weeds, it does not admit of any argument to support the superiority of the broad-cast over the drill. In the latter case, the drills cannot work; and in the former, the horse-hoes must be equally at a stand. The harrowing and trampling of sheep, or rolling, or, in lieu of these, in the case of a thin crop, hand-hoeing, of strong land, aided by the usual operation of weeding, and, if needful, with top-dressings, will be found to promote the growth of the corn; whereas the horse-hoes in such a soil, in a dry season, would have so unsteady a motion, as to cut up part of the rows, without being able to raise any mould towards earthing up the plants*.

Transplan-

* The advantage of earthing up wheat, where it can be done, was fully exemplified during the summer of 1796, in a piece of springy, loose, gravelly soil belonging to Mr. Robinson, of Wyck-house, which had been ploughed into one-bout ridges, each ridge and furrow about two feet in width. On these he dibbled three rows of wheat, and had the

Transplanting wheat is well calculated to increase the quantity of corn produced from a single seed-grain, and may be resorted to when the husbandman has procured a few grains of a new and very valuable variety of seed, or for curiosity; but a farmer should never extend it to field culture. He that should take up, divide a single root, and dibble it into the soil in two places, would earn less than the value of one grain of wheat; as an additional grain, sown in the proper season, would answer every purpose that can be obtained by transplanting, and the seedling plant would succeed better than the transplanted one. A man whose daily labour is worth 2*s.* 7*d.* probably might be able to transplant 500 roots in one day; so many grains of seed would cost a penny, therefore his master would lose half-a-crown by every day he employed a servant in that manner.

A wet summer, especially when there is much rain during the time *wheat is in blossom*, produces a deficient crop, and occasions high prices: on the contrary, a moderately dry summer, particularly when it is without any rain while the wheat is in blossom, brings plentiful crops, and lowers the prices.

Wheat sown in the spring, escapes the baneful effects of a wet autumn and winter, the severity of frost, and the depredations of slugs and worms; nor does it require any cultivation while growing.

---

repeatedly cleansed and earthed up: the effect on the crop was what might be expected—straw like reeds; and, when compared with some other rows adjoining the former, drilled and cultivated in a different manner, they were visibly three or four times more bulky; but in the latter case, too much seed had been sown, which every farmer knows, has the certain effect of producing thin straw, small ears, and altogether plants of a dwarf size.—*J. M.*

—commences about the [illegible]

[illegible] and. Ry[illegible] the [illegible]

[illegible] nearly a[illegible] weight of [illegible] operation of [illegible] down by a sickle [illegible] or [illegible]. [illegible] inches of the ground. [illegible] bagging; the [illegible] binds, and [illegible] bagging is, to all intents and [illegible] hand against the standing [illegible] applied, though [illegible] seen wheat mown against the [illegible] in some other places. [illegible] ging labour. However, [illegible] closer to the ground than is [illegible] and-reaping; it is equally [illegible] [illegible] quantity of straw, which [illegible] in this county.

[illegible] is generally begun as early as [illegible] days before the corn be [illegible] labourers, and to gain as [illegible] able, that the first reaped [illegible] the whole, indeed, comes [illegible] to be too ripe before [illegible] harvesting, from two to [illegible] over-ripe. When it [illegible] and clover, it is sometimes [illegible] day. In common cases, [illegible] is suffered to stand in the field

field from five to seven, or more days, which is said to promote its thrashing more freely and clean.

To the westward of the city of Bath, the excessive moisture of the climate has necessarily induced the occupiers of arable land to secure their corn in the field (immediately after it is bound) in round ricks, containing about a cart-load each, placing the sheaves in such a manner as to secure the ears equally against the rain, and damp arising from the ground. Every sheaf, from the eaves upwards, is placed sloping in a thatch-like manner, and in the form of a cone. One sheaf is inverted, and spread over this cone-like point; this method secures the whole until it suits the farmer's convenience to carry it to his barns or stack-yard. When these ricks are well made, they are secure against every possible quantity of rain, and for any reasonable length of time; even for a whole winter, if it were necessary to keep them out so long. The foregoing practice deserves imitation in all wet climates, and indeed in all others, in the case of a wet harvest.

8. *Thrashing*—is all done by the flail, and generally by the quarter; at the price of 4*s.*, and 1*s.* a load for binding the straw. Sometimes wheat is thrashed, and the straw bound at 2*d.* a truss: a little is done by the day. By all these methods, the men leave a quantity of lean corn in the straw; more when paid by the truss than when paid by the day.

Thrashers near London strike with an irregular blow: their rule is, to strike two or three blows rather smartly, and one or two so slightly, as to be of little use: thus relieving themselves from the necessary fatigue which the men of other places undergo in thrashing clean. This shifting, or desisting from labour, with the necessary perpendicular

middle of February; and as the greater part of the wheat is thrashed after that time, the loss to the farmers on this score, would average 15 per cent. or nearly 1*s.* per bushel.

The yield of several years varies the proportion which wheat bears to the straw very much, but the average is about twelve bushels of wheat to each load of straw. Such a load weighs 11 cwt. 2 qrs. 8 lbs. It has been said and I believe truly, that the straw of autumnal-sown wheat is more harsh, and less agreeable to cattle, than the straw of wheat sown in the spring.

The greatest crop of wheat of which I have any account, is 68 bushels per acre: the least is about 12. The medium between these extremes is 40, which I think would be the average of land highly conditioned. The average produce of Britain does not exceed one half of this quantity, and yet wheat is as certain a crop as any that is cultivated. Can greater proof be required, that the lands of England are reduced considerably below par? This can have happened only by a too frequent repetition of corn crops, and general bad management, which has, of course, lessened the quantity of live stock, and with that, the best means of raising manure. In future, let the farmers be induced to sow crops to be eaten on the land by cattle, so that they may there leave their dung and urine. The corn will then grow in double quantity; and the live stock, supported by such green crops, will be clear gain to the community.

An

An Estimate of the Produce, Expense, and Profit, of a Crop of Wheat, grown Eight or Ten Miles from London.

THE PRODUCE.

	£. s. d.	£. s. d.
Corn.—Supposing an average crop to be 30 bushels per acre, and sold at the medium price of 18 years, from 1783 to 1802, which includes two years of scarcity, and one entire period of peace and another of war, in the London market, at 6*s.* 6*d.* is - - - - - - - - - - - -		9 15 0
Straw.—During the same period, land that yields 30 bushels of corn, produces two loads and a half of marketable straw, which, under good management, has produced 2*l.* each, or per acre, -	£. s. d. 5 0 0	
Short straw, and cavings, - - - - - -	0 5 0	
At these prices, the straw and chaff are worth 3*s.* 6*d.* per bushel on the wheat, or per acre, - -		5 5 0
The whole annual produce of one acre is - -		£.15 0 0

Which is equivalent to 10*s.* per bushel on the corn.

THE EXPENSE.

	£. s. d.	£. s. d.
Bagging (reaping) perhaps it should be called fagging, per acre, - -	0 15 0	
Resetting shocks up after wind, rain, or otherwise, - - - - - -	0 1 0	
Cartage and housing, or stacking, 7 men, 2 boys, 3 carts, and 5 horses, to get 10 acres into the barn in one day, cost 40*s.* which, divided by 10, is per acre, - - - - - - -	0 4 0	
At these charges, harvesting one acre costs		1 0 0
Thrashing 30 bushels, at 5*s.* per quarter, is per acre, - - - - - -	0 19 0	
Assistance to winnow, - - - - -	0 1 6	
Marketing the corn. The farmer must ride to the corn-market, and supposing him to sell on every such day 100 bushels of wheat, the toll-gates and liquor will cost him 2*s.* or per acre, - -	0 0 6	
Carry over -	£.1 1 0	1 0 0

Brought

	£. s. d.	£. s. d.
Brought over -	1 1 0	1 0 0
One man, 3 horses, and a waggon, one day, to deliver 100 bushels, 15*s.* or per acre, - - - - - - -	0 4 6	
Toll-gates and beer on ditto, - - -	0 1 6	
Thrashing, winnowing, and marketing the corn, costs per acre, - - - -		1 7 0
Binding 2 loads and a half of straw into trusses, - - - - - - -	0 2 6	
Marketing the straw. Two horses and a man one day, 11*s.* 6*d.* toll-gates 1*s.* beer, salesman's charges, and room for a stand cart at the market, 2*s.* is per load 14*s.* 6*d.* or per acre, - - - -	1 16 3	
Binding and marketing the straw costs per load, 15*s.* 6*d.* or per acre, - -		1 18 9
To return a load of dung two additional horses are used: they cost 8*s.* 6*d.* and the dung 2*s.* 6*d.* together 11*s.* per load, or per acre, - - - - - -	1 7 6	
By the time this dung is spread on the land, it costs an additional eighteen-pence a load, or per acre, - - -	0 3 9	
Manure, and spreading it on the land, costs per load 12*s.* 6*d.* or per acre, -		1 11 3
The last four articles show, that converting straw into manure, and getting it spread on the land, costs 1*l.* 8*s.* per load.		
Two ploughings, harrowing out the root-weeds, raking them together and burning them, per acre, - - - -	2 10 0	
Other harrowings, per acre, - - -	0 7 0	
Water-furrowing and gripping, - -	0 2 0	
		2 19 0
Seed, steeping, and sowing, - - -	1 0 0	
Fences, gates, ways and stiles, - -	0 2 0	
		1 2 0
Carry over - - -		£.9 18 0

	£. s. d.	
Brought over - - -	9 18 0	
Wheat sown in autumn, will in the spring of the next year require one or all of the following operations, namely, harrowing, hoeing, hand-weeding, top-dressing, and rolling, which costs from 5*s.* to 20*s.* per acre, but say only -	0 10 0	
The farmer of 200 acres ought not to do without a saddle-horse, and he must be very economical to keep the expense of it down to 30*l.* a year, which on his arable land will be equivalent to 4*s.* per acre; and his petit expenses of other kinds than any yet mentioned, will unavoidably amount to 10*l.* a year, or 1*s.* per acre. These two trifles amount, per acre, to - - - - . -	0 5 0	
Rent, tithe, taxes and assessments, for one year, are supposed to be - - -	2 17 0	
The whole of the foregoing charges amount, per acre, to -		13 10 0
Which, taken from the produce of 15*l.* leaves per acre, -		1 10 0
Deduct the interest of a capital of 10*l.* per acre, - -		0 10 0
Remains the profit per acre, - - -		£.1 0 0

Such a profit is about one moiety of the rent; it is as high as the farmers, at eight or ten miles distance from London, usually make by a crop of wheat, after pease or tares, on a soil that is suitable for turnips or barley; but on stronger land, or under the unfavourable circumstance of being foul, or after beans, which may happen to make it necessary to plough and harrow three times preparatory to sowing the grain, there cannot be any profit.

If such a man should think, with many unscientific farmers, that fallowing land for wheat is a wise practice, he will not only lose every chance of remuneration, but he will, by that measure alone, substitute, in the place of

of interest and profit, a positive loss, over the whole e tent of his fallow land, of per acre 4*l.* 12*s.*; that is,

Another year's rent and taxes, ...	£. 2	17	
One additional ploughing, and perhaps harrowing, ...	1	0	
Another year's interest of 10*l.*	0	10	
Ditto, saddle-horse, and petit expenses, ...	0	5	
The additional expense of a fallow is per acre,	£. 4	12	
I repeat, that the profit of a crop of wheat which produces 30 bushels per acre when the soil is foul or adhesive, and may require to be three times ploughed, is	nothing.		
Ditto, after pease or tares, per acre, ...	1	0	0
Ditto, after turnips, cole, potatoes, or clover, per acre, ...	3	0	0
Ditto, after a fallow; it is more expensive and less profitable than any of the foregoing methods by per acre, ...	4	12	0

By what has been said it seems to be proved, that the only method of growing wheat near London with a tolerable profit, is to sow it on one ploughing after turnips or cole, potatoes, or clover; thus keeping down the number of ploughings and harrowings, and converting the expense of them into a handsome additional profit. This is only a small part of the advantage of avoiding a fallow and numerous ploughings: the greater consists in the increased produce of corn, which would be the consequence of such manure as would be left on the land by the cattle employed in fattening on the green and root crops; and most of all, in such crops advancing lean sheep and neat cattle into the state of fat, fit for the butcher.

10. *Man*

10. *Manufacture.*—The farmers sell their wheat to mealmen, who manufacture it, and sell the flour to the bakers, and the pollard to the farmers and others, for the food of horses, hogs, &c. The best flour is mostly sold to pastry-cooks, and the makers of fine biscuits. The bakers are generally indebted to the mealmen more than they can conveniently pay, consequently it is not in their power to buy the best flour, but are under the necessity of being content with seconds, and, in many cases, with such a mixture as the mealman may choose to supply them with.

The price of meal is regulated by the mealmen, in combination, to keep it as high as they can, instead of being ascertained by the average of all the corn sold in the market, among which there always is a considerable proportion imported from various parts of the world, brought, as well in close vessels, as in those that are without decks, originally of inferior quality, but rendered worse by being heated. These damaged wheats, in the first place, are cleansed, and then mixed with English corn of every quality; to which is frequently added white pease, which are very favourable to mixing with wheat, owing to the bran of the two being of the same colour. It is also said, that the meal of this mixture is occasionally increased in weight, as well as improved in colour, by an addition of the meal of horse-beans. With the latter I am not personally acquainted, nor will I be answerable for its truth; but it cannot excite surprize that much is done in this way, since a great number of experiments were made, particulars of each sort of mixture published, and the mealmen invited to do it, during the late high price of bread.

The bakers in London are reduced to the necessity of using a preparation from alum, which they are said to

buy under the fictitious and unmeaning name of *stuff*, the purpose of correcting any improper smell or ta which might otherwise be found in the bread. Th matters sufficiently account for the fact, that the price the best wheaten bread in London, is at least 2*d.* in peck loaf under the quality of bread of the same denom nation in the interior parts of the country.

The following evidence was given before the Corn a Flour Committee in the City of London, 1795.

'Mr. SAMUEL WYATT gave a very accurate descripti of the operation of the Albion-mills, by various calcu tions of the prices of wheat and flour for sixteen yea viz. from 1774 to 1790, the latter five years of whi period, when the mills continued to work, the act saving to the inhabitants of the metropolis was 866,66 (173,332*l.* per annum). The consumption he stated be 20,000 sacks per week, that is, 120,000 bushels wheat!!! He said, the port of London was now (15 October last) overloaded with wheat. The proprieto at the time the mill was destroyed, were about to erect third steam-engine. The mills improved the quality the flour*, and prevented a combination among th millers, which reduced the price. They 'would hav been perfectly satisfied with the profit of one halfpen per sack†'. The land carriage from Reading is 4*s.* 6 per sack, and so in proportion for other manufactures i the country; and if it was sent in barges, by the Thame those vessels were liable to be delayed in summer fro want of water, and in winter from the navigation bei stopped by ice; neither of which inconveniences attend

* It is supposed Mr. WYATT here means by grinding it from w only, free from pernicious mixtures.

† One halfpenny per sack profit is wonderfully low.

the operation of the Albion-mills, 'because no alteration of the weather could affect them.' He was perfectly convinced, 'that flour might be sold 8*s.* per sack lower than the average quarter of wheat; and if ground upon the spot, the difference might be still greater. Even in the great frost, in 1789, the Albion-mills furnished flour at 7*s.* 8*d.* per sack below the average quarter of wheat.' Mr. WYATT was clearly of opinion, that a number of mills erected near the metropolis, with one steam-engine each, would be beneficial.

'Mr. TITUS WOOLHEAD, late a flour-factor, in answer to a number of questions, informed the Committee, that a few opulent individuals have the entire guidance of the market, and return to the meal-weighers what price they please for the flour; which price is generally regulated by sales to the *necessitous* baker, who is obliged to take his flour at such a price as the mealmen may chuse to give him credit, and that is frequently an extortion. This is the price given to the meal-weighers as the *bona fide* sale; by which unfair means, the assize of bread is often times improperly advanced. The remedy for this evil would be, a fair and candid return of wheat and flour sold at the corn-market.'

According to the evidence of these gentlemen, the Albion-mills were a great public benefit: indeed, their destruction does seem to be a misfortune to the inhabitants of London.

On another occasion, Mr. Alderman CURTIS said, the magistrates were frequently obliged to raise the price of bread, though that of wheat had fallen; and, in his opinion, there would be no remedy adequate to that of a fair competition, which would take the supply of the metropolis out of the hands of those worthy gentlemen, the millers and the mealmen, whose opulence was such,

and capitals so great, as to place the bakers in a complete state of dependence on them. There were in the metropolis, and within ten miles of the Royal Exchange, to which these regulations extended, 3000 bakers, of whom 2500 were dependant on those millers, on account of the credit which they received from them. This was an evil which ought to be checked.

The bread consumed in London is not prepared from English wheat unmixed with the leaner produce of other countries, otherwise the following experiment would shew with accuracy, the quantity of bread that could be made from a Winchester bushel of that grain.

One bushel of English wheat weighed 61lbs. It was then ground, and the meal weighed 60¾lbs.; that being dressed, produced of flour 46¾lbs. of the sort called seconds, which alone is used for making bread throughout the greater part of England; and of pollards and bran 12¼lbs.: that was bolted, and it produced in sharps 3l[illegible] which being sifted, produced in good second flour 1¼l[illegible]

The whole quantity of bread flour obtained from the bushel of wheat weighed		48[illegible]
Fine pollard, ...	4¼ lbs.	
Coarse pollard, ...	4	
Bran, ...	2¾	
	—	11
Together, ...		59l[illegible]
To which add the loss of weight in manufacturing this bushel of wheat, ...		2l
Produces the original weight of		6[illegible]

One sack of marketable flour is by law oblige[illegible] weigh 240lbs. which happens to be correctly the pr[illegible] of five bushels of such wheat, as five times 48lbs. i[illegible] Again, as one sack of flour is always supposed to

eighty quartern loaves of bread: it only requires me to divide 80 by 5, to prove, that 16 of these loaves are made from each bushel of such wheat. The bakers admit they can make two or three loaves more than 80 from one sack of flour, when it is the genuine produce of good wheat; that is, in the proportion of about 16½ loaves from each bushel of sound grain, and, it may be presumed, 16 from a bushel of medium corn. Sixteen loaves at the present price (1803), which is 9¼*d.* costs the consumer 12*s.* 4*d.*; whereas, the average price of wheat in the London market is 6*s.* 6*d.*; deduct a very small sum for the miller's mixing with cheaper ingredients than wheat, and it reduces the price of a bushel of grain to less than half the price of the bread made from it.

Lord SHEFFIELD, Mr. WYATT, and others, suppose the consumption of London to be 20,000 sacks of flour weekly, and that they are equivalent to 120,000 bushels of corn per week; that is, annually, 6,240,000 bushels, or 780,000 quarters: but the known number of people and manufactories supplied by the London market, seem to require a quantity considerably greater. I apprehend it cannot be less than 23,000 sacks of flour weekly, the produce of 138,000 bushels of corn: the latter quantity multiplied by 52, the weeks in a year, gives 7,176,000 bushels, which are equivalent to 895,750 quarters of grain. This is nearly one quarter of corn for each inhabitant, and, including the flour used in manufactures, the entire consumption cannot be any less; in round numbers, it may be said to be 900,000 quarters.

The bakers estimate the expense of manufacturing a sack of flour into bread, and selling it, in the following manner, namely:

	s.
Journeyman's wages,	3
Salt,	1
Yeast,	1
Fuel,	1
Repairs of utensils,	0
Candles,	0
Allowance to shops for selling bread,	0
Together,	8

	s.
They are allowed by Act of Parliament, on every sack of flour, for their expenses and profit,	12
Deduct the foregoing expenses,	8
Remains what is erroneously supposed to be their profit,	4

They increase their profit by making more than [illegible] quartern loaves of bread from each sack of flour. The[illegible] are enabled to do so in various ways, but principally an[illegible] certainly, by contriving to bake their bread rather le[illegible] than in strictness they ought to do, and by that mea[illegible] leaving about one ounce, and three-fourths of an ounce, [illegible] water in each loaf, which would be evaporated if th[illegible] bread was baked in the most perfect manner. This insu[illegible]ficient baking creates an additional gain of 140 ounces, o[illegible] two quartern loaves per sack. Such bakers as have su[illegible]ficient energy and property to procure the genuine flou[illegible] of wheat, and that of good quality, can obtain two mor[illegible] loaves by that means. But in order to do that, they mu[illegible] not be in debt to their mealman; and as most of the[illegible] are considerably so, such men cannot obtain the genuin[illegible] flour of sound wheat; therefore, I shall make this part [illegible] my estimate to suit the cases of ordinary management, [illegible]

which

which rate they cannot gain any more than two loaves as aforesaid: these vary in price from 9*d.* to 18*d.* Suppose the average to be 11*d.* they amount to 1*s.* 10*d.*: together per sack 5*s.* 9*d.* The profits which arise from baking puddings, pies, and joints of meat, for the customers of every baker, vary according to their situation, number, and respectability, but generally from 10*l.* to 50*l.* per annum; or, according to the case of one man, which now lies before me, whose annual manufacture and sale is 676 sacks, this kind of baking produces to him a net profit of 25*l.* per annum; that is, equivalent to 9*d.* per sack on the whole quantity of flour which he uses. But he, and every man of business, has losses by bad debts; these, with the same person, amount annually to about 16*l.* or 6*d.* per sack. Take the bad debts of 16*l.* from the profits of baking for hire, 25*l.* and the remaining 9*l.* is equivalent to 3*d.* which add to the former profits of 5*s.* 9*d.* and we have the entire net profit of a baker on each sack of flour, 6*s.*

A manufacture of 676 sacks, yielding a profit of 6*s.* each, produce an annual income of 202*l.* 16*s.*; which may be divided into,

Rent, ... £.	20	0	0
Taxes, assessments, insurance, and repairs,	12	16	0
To support a family, ...	150	0	0
To meet unforeseen expenses, losses, or to accumulate, there only remains annually,	20	0	0
£.	202	16	0

To suit the cases of such men as use the unadulterated flour of good wheat, we should add 1*s.* 10*d.* to 6*s.*, together 7*s.* 10*d.* per sack, and that would shew their profits on 676 sacks of flour to be annually 264*l.* 15*s.* 4*d.*

II. RYE.

There are a few acres of rye grown on many farms the more sandy nature in this county, for spring gre feed. It comes very early, and holds in perfection thr or four weeks; the rest (being then superseded by wint tares) is permitted to ripen its seed, which it does abo the middle of July, at which time the straw alone som times sells at four or five pounds per acre. The seed sown from the middle of August till the middle of Se tember: it is also sown mixed with winter tares; but is not a very convenient grain for that purpose, owing its being fit to cut as green food a fortnight before tl tares, and ripening much too early to accompany the However, it should not be quite disregarded, as it is o of the links of a chain of green food that may suppc cattle on an arable farm all the year round.

III. BARLEY.

There are about 4000 acres of land annually sown wi barley in this county. In the common fields it succee wheat, but in the enclosures it follows turnips, po toes, &c.

The tender nature of this plant in its infant state, uni it for cold and compact soils. It thrives best in a loa sand that is moderately dry and friable; and, as it be sowing late in the spring better than oats, or any ot corn, it is usually the last which the farmer puts in t ground that season. But it requires the soil to be p pared by perfect tillage; this reduces the weeds ve much, and as it only occupies the ground about fo

mont

months, they have not time to recover themselves, and perfect their seed: therefore, barley is justly supposed to be a clean crop.

The nature of corn crops require, that it should not, on any account, be sown after either wheat, rye, or oats: the much better practice being, to sow it after turnips, potatoes, carrots, tares, &c.; and, in some cases, after hemp, flax, and rape. The land should not receive any further manure than the dung and urine deposited by cattle, during the time they were eating the preceding green or root crop off.

1. *Preparation.*—The soil should invariably be well pulverized, and rendered open by a thin ploughing, and then by harrowing; which should be followed, at as great a distance as the season will allow, by a more deep cross-ploughing and harrowing, and, in some cases, it may even want rolling. The seed should then be ploughed in with a very small furrow; and when the intention of the farmer is to have winter tares follow the barley, the land should be immediately rendered smooth, by a light pair of harrows with short tines: but when it may be intended for the barley to be succeeded by clover, the latter should be immediately sown, and covered by the said slight harrowing. The next thing to be done is, with one horse to draw a very light roll over the land, in order to press the mould gently on the seeds. These operations promote a more certain, speedy, and equal vegetation, than can be procured by harrowing in the seed. Though the latter method is the more usual, it is the cause of much grain being lost, and also of the crop being of two or three growths. Many farmers postpone the last rolling until the first leaves of the seeds are up, but it is believed, more from the hurry of the season than

than from choice; thoug
the better season for sowi
seldom fails to secure a g
of clover.

In case of land springs,
not to plough the land f
eighteen inches wide. T
in any weather; at least
dry days will prepare the
the second ploughing; a
tinue unfavourable, the l
might be laid up in a si
when two or three mor
render it fit to be harro
ploughing in the seed; o
be given, and the seed ha
the better practice, whe
could be wished.

Scuffling the land, ins
would in every fine seas
saving of expense. Scuf
cross-ploughing; and in
weeds, it is much better,
of the harrows. It will
quantity of work with the
and leave the land equally
previous to the sowing.

2. *Sort.*—Barley is ne
county in the autumn.
usually grown. On rich
barley, which produces a
sown, owing to its being
than the other sorts. Th

taining two rows of grain in the ear, is sown in every case when the soil is not so rich as to endanger lodging the crop.

Barley, like wheat, is the better for being short, thick, or plump, of a fair colour, and thin skin, which increases its weight, the quantity of meal, and the price of the grain at market.

'A bushel of barley, which weighs 52lbs. is supposed to contain about 515,000 grains.'

3. *Steep.*—The seed is never steeped, and yet the farmers are continually complaining of its coming up at different periods; thus producing two crops, which do not become ripe at the same time, and are injurious to the sample. Steeping the seed a proper number of hours (which might be ascertained by experiment), seems to be as well calculated to secure a uniform vegetation, and prevent this complaint, as poisoning the seed appears to be to keep it from vermin.

Steeping seed barley in dung-water for 24 hours, produced, over three closes, 60 bushels per acre of an equally ripe sample. The comparison ridges, sown with the same corn without steeping, produced 20 bushels per acre of a very inferior and unequal sample.—See the third volume of Bath Papers, p. 326. There is also contained in the second volume of the same Society's papers, a statement of the great advantage of steeping seed barley 24 hours, even in clean water.

4. *Seed—(quantity sown).*—The quantity of seed varies much with the quality of the land, and also with the season of the year; it being advisable to sow much less seed on land in high condition, than on an exhausted soil. Early sowing requires less seed than late; but on a medium

medium soil, in proper condition, sown broad-cast, in March three and an half, in April four, and in May four and an half bushels per acre. A rich soil makes such great difference, that it can hardly be sown too thin; even one bushel and an half early sown, have produced as much as could stand; whereas, had three or four bushels been sown, the crop would have been lodged, and of a very reduced value.

5. *Time of Sowing.*—Barley is usually sown during the months of March, April, and May, and it has succeeded when sown the first week in June; though it ought to be sown as early as the soil is sufficiently dry and in condition to receive it, and the prior attention which is due to the oat, tare, and other crops, will permit; as barley will bear late sowing much better than those crops.

6. *Culture while growing.*—None is necessary, nor any given.

7. *Harvest*—commences about the middle of August and generally after the oats and wheat are reaped. It is nearly all mown with scythes, previously furnished with a bow or cradle, to collect the corn together, and keep it from scattering. Some of the heaviest crops are then bound into sheaves, and set up in shocks; but in general it lies in the swaths till it is in a proper state to be carried. It is then raked into rows, and heaped at such a moderate distance from each other, that, when a cart or waggon is placed between two rows of heaps, a man on each side may pitch to the load without over-reaching. It is then drawn home, and put into a stack, or barn, in the same manner as hay. Barley is less in danger of shaking out of the ear, from being too ripe, than any other corn;

corn; which is one reason for its being the last reaped.

8. *Thrashing.*—All done by the flail: but the straw in general is not bound into trusses; though some of it is, and sold for the purpose of packing.

9. *Produce*—varies from 15 to 75 bushels per acre. The average produce of the county is about four quarters of corn and two loads of straw per acre. The straw usually sells at about a guinea or 25*s.* a load, delivered, which, with chaff and thin grain, rather exceeds 1*s.* 6*d.* per bushel on the corn; and, as the corn has averaged nearly 3*s.* 6*d.* together they produce 5*s.* per bushel, or 8*l.* per acre.

The ultimate destination of barley, to be converted into beer and spirits, raises the value of this crop to more money per acre than that of any other grain. For after the farmer has disposed of it, the maltster, brewer, distiller, rectifier, and victualler, successively draw the wages of labour and profit from it, before it comes to the consumer. Including a revenue of five and one quarter millions a year, which it netts to Government, but which costs the subject between six and seven millions, its entire expense to the consumer at this time, is not less than 44*l.* per acre*.

10. *Manufacture.*—Much of the most ordinary barley

* I understand that porter is now brewed in the ratio of 144 gallons, that is, one butt and a half, from one quarter of malt; and is sold by the retailer after the rate of 1*s.* 8*d.* per gallon, which produces 12*l.* Deduct the value of the hops, and there remains upwards of 11*l.* per quarter for the malt, or 44*l.* per acre. In the article of spirits, it must necessarily yield much more.—*J. M.*

is

is given to poultry: the rest is sold to the maltsters, ε cept so much as is reserved for seed.

Pearl Barley.—A mill to manufacture pearl barley cos about 20*l.* A ton, or 160 stone, of pearl barley, sells f 23*l.* which is rather under 3*s.* a stone, or 13*s.* 4*d.* bushel. Twenty-three stone and a half of common ba ley produces *five stone and a half* of pearl barley, by tl common method of manufacturing it; but by an additic to the mill, which would only cost 2*l.* the barley-co might be split, and then the same quantity would yie *nine stone* of pearl barley. (Minute of Evidence before Committee of the London Society of Arts, &c.)

A bushel of good barley weighs 50lbs. at which r 400,000 bushels are equally heavy as the 20,000,000lb weight of tea supposed to be consumed in the Brit nation. This quantity of grain, at three quarters an half per acre, might be grown on 14,286 acres; the fore, if an infusion of barley or malt, in ale, or oth wise, should be capable of making an equally nutritic and wholesome breakfast as tea, there would be no di culty in growing barley for that purpose.

One bushel of barley makes considerably more tha bushel of malt; so much so, that five bushels of malt supposed to be the produce of four bushels of barley.

Strong intoxicating ale may be brewed, ...	12 gallons from a bus of malt.
Ale, ...	18 gallons per bushel.
Small beer, of a poor sort, ...	36 ditto.

Beer, strong enough for breakfast, might be brewed the rate of 27 gallons per bushel.

IV. OA-

IV. OATS.

Oats are but little grown in this county, nor would I recommend them as a fit crop for a Middlesex farmer, in his common-field land; but on enclosed clayey loams they may be introduced occasionally, as all argillaceous soils are much better calculated for the production of oats than barley. I shall offer only a few general observations on this grain. In the first place, oats will grow on almost any land, though with them, as with most other crops, the richer the soil the greater will be the produce; even up to 100 bushels per acre. Next, they always sell for less money per bushel than barley; but then they are a more certain crop, which circumstance, added to the superior quality of the oat straw for the support of cattle, and to their yielding more in quantity, places them on an equality with barley for medium loams. For stronger soils, and fen or peat earth, they are much more suitable than barley, though they are a crop which leaves the soil rather more foul and dense.

The soil ought not to be manured for oats in any greater degree than as I have described for barley, nor ought they ever to follow wheat, rye, or barley*. They may be sown in tenacious, cold, fenny, and wet soils, or in others that are not in condition for barley; and they will succeed very well after any green or root crop.

1. *Preparation.*—After turnips, cole, or cabbages,

* There are some instances of oats having been sown after other corn, on land exhausted and foul, as the last resource of knavish poverty.—*J. M.*

plough

plough only once, and let that be as early as the preceding crop is off, and the other works to be done on the farm will permit, into ridges fit for sowing. Sow oats broad-cast, and cover them with harrows suitable to the state of the land; if it be dry and crumbly, as it ought to be, immediately draw a very light roll over it, thereby pressing the mould gently on the seed: otherwise, postpone the rolling till a dry time, after the blades of the corn are up.

2. *Seed—(quantity sown).*—The quantity of seed ought to be varied, in the same proportion as I have stated in my account of barley; but on a medium soil, in proper condition, sow broad-cast in March four bushels, or in April five, and so in proportion to the lateness of the season. For oats that will succeed in very cold and exposed situations, see the Roxburgh Report, page 85.

3. *Time of Sowing.*—Oats are usually sown the first dry weather in the spring, from the middle of February till the end of April; and the most early sown are supposed to be the most promising for a good crop, an early harvest, and a good sample. But as I prefer raising the soil to a high pitch of richness, by growing and consuming on it green and root crops, and recommend generally the sowing wheat on land in such high condition till the middle of March, I can only advise my readers to sow oats after that time, as early as the land may be got into readiness, and successively till the end of April. Oats have been sown in the South of England in the autumn, and when the winter happened to be mild, they produced large crops, with straw of a surprizing size; this is curious, but not fit for general practice.

4. *Culture.*

ture.—The thistles are usually cut out by hooks, ›ther weeds drawn by hand. Should a crop of › luxuriant as to fall or lodge, it will receive less :han any other grain; therefore the farmer need ınder any apprehension of its being too rank, the young clover, if such were sown, would in ısure be injured by the crop being too heavy.

rvesting.—Oats are harvested in this county in manner as barley. They should be cut as fast ›ecome ripe, or rather two or three days before ripe, or they will shed very freely, either with l or in harvesting. Care should at the same taken, not to cut them many days before they as it is difficult to thrash the unripe grains out of '.

rashing.—The same as I have before described for

oduce—is from four quarters to twelve; perhaps ld average the county.

propriation.—All given to horses; nor is there a :he county that can manufacture them into oat-grits.

V. BEANS.

: are about 3000 acres of land annually cropped ıns in this county; and they are cultivated in the an and perfect manner.

ı are a crop which thrive well in almost any soil

that is rather strong, such as medium loam, sandy clayey loam, and chalky loam: on clay, marl, and such like cool subsoils. They require a soil th seldom be worked without damage during the wint spring, consequently it ought to be manured gathered into one-bout ridges, before Christmas. shape of these ridges keeps the land more dry throu winter than any other, and prevents excessive rain washing away the manure, which had been prev folded by the plough into the centre of such ridg which state it should lie until the season for s when the land, thus prepared, will be so dry as to of dibbling nearly every fair day, which secures t farmer the advantage of choosing his season.

They should be manured for, and kept perfectly while growing, by ploughing, horse or hand hoeing hand-weeding; and where they are so managed, th a tolerable preparation for either wheat or oats.

Beans have a tap-root, and hence they are more to succeed after crops that have fibrous roots; the never heard that they would not grow after any They are generally sown after wheat, barley, or and ought to be planted on ridgelets, especially on skinned soils.

1. *Preparation.*—Immediately after the wheat sown, the farmers of this county manure their stubble, and plough the land into ridges of about t feet wide, so as to finish before Christmas, in whicl it lies till the season for planting. This is a good m but perhaps a better would be, to plough the lan ridgelets of two feet six inches wide; in which stat lie until the season for planting, when the seed n dibbled in, one row of beans into the middle of ri

tidgelet, at the distance of about three inches from bean to bean. They should be immediately covered, which may be done by children, with a garden-rake or hoe; or, should the land be dry and crumbly, a horse and a bush-harrow would do as well. In most places, it is advisable to set a boy with a rattle to frighten away the rooks, until the beans are up.

The distance between the rows will not prevent the crop from completely covering the ground, if the land was manured for them, as they will branch out sideways, three or four stout stems from each root.

2. *Sort.*—Tick beans are by some thought to yield rather the greatest produce; but the horse-beans grow higher in the stem, smother the land more, and are more suitable for the stronger soils.

In purchasing beans for seed, care should be taken to choose those that are bright, hard, and plump. The smaller they are, the greater number will of course be in the same measure, and the higher price they will produce at market. 'A bushel, weighing 64 lbs. is supposed to contain about 35,000 beans.'

3. *Steep.*—None used, nor for early planting is it necessary, but in a late season it would be useful.

4. *Seed—(quantity).*—According to the practice of this county, the seed is nearly four bushels. The women are paid 4*d.* a gallon for dibbling in the seed, which they perform with astonishing rapidity, along a line stretched across the ridges, leaving a space of fifteen inches between each row; the seed is covered by a bush-harrow, drawn by horses who walk in the furrows. In some cases, they cover the seed with the end of the dibble.

In rows of 30 inches apart, the seed used would be about two bushels.

5. *Time of Sowing.*—In mild and sheltered situations, the latter half of January; and in more exposed places, as early in February as the soil and season will permit. January and February are good seasons; March but indifferent, and April is wholly unfit. A hard frost after they are up, would injure them much, and a very severe one, followed by a rapid thaw, would destroy them.

Early planting contributes to secure the crop against its greatest enemy, the black aphis.

6. *Culture while growing.*—When the crop is about five or six inches high, the intervals are always hand-hoed, and the rows weeded; which operation is repeated just before they blossom, carefully drawing the mould up to the plants at the latter hoeing. If the land should be so temperate, a little before the time of the second hoeing, as to admit of being worked by a plough or a horse-hoe in earthing up the rows, it would be of great advantage to the crop; but the clayey loams are only in a condition to be so worked during a few days soon after heavy rains. A showery summer is more favourable to beans than a dry one.

If the expense should not be too great, it would be right to pinch the tops of the beans just as the blossom is set, and, if possible, before they are attacked by the black aphis. It is thought this would seldom injure the crop; and as it would sometimes save it from being destroyed by this noxious insect, the advantage on the whole, most probably, would more than repay the expense of the operation. It would increase the size of the beans, make them measure more, and become sooner ripe; and this last

ast circumstance would give the farmer more time to prepare his land for the succeeding crop.

7. *Harvesting.*—They are bagged close to the ground, bound, and set up, generally four sheaves together, and are tied with a part of the beans, though sometimes with straw ropes, and at other times with the yarn of old hemp ropes, especially when the beans are too ripe to make binders for themselves.

A species of bean that would ripen in July, would have several advantages over other beans of later habits; such as escaping the ravages of the destructive aphis, and clearing the land in better time for the succeeding crop. The Society of Arts offer a premium for such a discovery. The present beans are seldom ripe enough to cut till the latter end of August, and the proper time is, when the kids are turning black, about ten days before they would begin to open at the ends. Though in some parts of the field the kids may not be so black as in others, this should not prevent their being cut, for they will ripen and harden after that is done, by setting the sheaves upright, and leaving them in the field for a week or ten days. If they are cut long before they are ripe, they will shrink and shrivel; and if too ripe, they will shed considerably; though there is much less danger in reaping them too early than in letting them stand too long. Those that are over-ripe should be cut with the dew on them, and carried to the barn in the same state, and the green parts of the crop should be cut in the middle of the day.

When the intention is to sow wheat or tares after beans, they ought to be set up so as to occupy as little space as possible, that the vacant ground may be immediately prepared for the next crop.

8. *Thrashing.*—All done by flails; thrashed and cleane[illegible] at 2*s.* a quarter.

9. *Produce*—varies from 10 to 80 bushels per acre. [illegible] is rendered a very precarious crop by the ravages of m[illegible] riads of small black insects. The average produce of t[illegible] county is probably about 30 bushels per acre.

The straw is generally employed in bedding the f[illegible] mer's horses, and other cattle; and also in littering [illegible] farm-yards, where it is picked over by young sto[illegible] though sometimes a load is sold for 20*s.* or 25*s.* de[illegible] livered.

10. *Appropriation.*—Mostly given to horses, though great quantities are shipped for Africa, and the West Indies, as diet for the negro slaves. Some of the better sorts are podded while green, and sent to the London markets. When pigs are fed with beans, the meat becomes so hard as to make very ordinary pork, but good bacon. Also it is supposed, perhaps erroneously, that the mealmen grind many horse-beans, and mix their meal with that of wheat, to be manufactured into bread.

Beans do not deserve the attention of a modern farmer; they require much cultivation while growing, and prevent the same land bearing any other crop for a whole year; they are not well calculated to support cattle, and manure the land. Wherever beans are raised, there tares might be grown. The previous crop and preparation of the soil for beans, in this county, are equally suitable for winter-tares. The latter is a crop that is vastly more certain; it requires very little or no cultivation while growing, and it is procured at much less expense. Tares smother many weeds, fatten cattle, manure the land, and are harvested by Midsummer, which, on strong land, gives

ives the farmer time to cleanse the soil by a demi-fallow, nd in that way prepare it, in a superior manner, for heat; or it may bear a crop of turnips after the tares, nd be equally ready for corn.

VI. PEASE.

There are about 3000 acres of land annually cropped with pease in this county; they are much on the increase, *and are cultivated in the most clean and garden-like manner.*

1. *Preparation.*—On upwards of 2000 acres they succeed a clean crop of beans; in which case, the bean stubble is about January, and during every dry time till March, ploughed up with a thin furrow, and soon afterwards re-ploughed a full depth. The water-furrows are kept open, and the land remains in this state till seed-time.

The pease grown with the intent of being gathered *green*, and sent in their pods to market, succeed clover, corn, or any other crop. The land appropriated to this use, is generally a dry loamy sand; and manure is usually ploughed in during January and February; after which it is harrowed, and is then fit for the reception of the seed, which is put into drills, fifteen inches apart, mostly made across, but occasionally along the ridges; and the seed is covered in with hoes. Some persons bush-harrow the whole, which gives the land a more neat and compact appearance.

2. *Sort.*—White pease are the only sort raised for being

gathered green; of these, there are several varieties, the hotspur, early Charlton, marrowfat, &c.

Grey pease of several varieties, are nearly the only s grown on the afore-mentioned 2000 acres; one bushel which, weighing 64lbs. contains about 107,000 pease.

3. *Steep.*—Not any in use.

4. *Seed.*—The quantity sown is generally about th bushels per acre.

5. *Time of Sowing.*—Such as are intended for bei gathered green, and sent in their pods to market, are p into the ground every week or fortnight during t months of January, February, and March, for the pu pose of producing a regular succession of crops, to ke up the daily supply. The grey pease are sown during t whole of March, beginning as soon in the month as t soil can be got into proper condition after the bean see time is finished.

6. *Culture.*—The intervals between the rows of eve kind of pea, are twice hand-hoed; once when the plan are about three inches high, and again a short time befo they blossom. The rows are laid down and well earth up, by the latter hoeing, and they are carefully weed by hand.

7. *Harvesting.*—Against the podding season, the po people from every part of the town apply to the farm who have early pease. Many of the gentlemen, and rich farmers, sell their pease by the acre, to persons who e ploy the podders; and most of the poor and common f mers select a certain number to gather the pods, whi

in every case, is done by the sack of four heaped bushels. The number of these people employed by any one person, is proportioned to the number of acres—about forty to ten acres: the whole is a scene of bustle and chearfulness, though in rags; and the work is by some continued on Sundays as well as other days. The carts are loaded and sent off at various hours, proportioned to their distance from market, so as to deliver their loads to salesmen in the different markets, from three till five o'clock in the morning.

The pease are usually picked twice over, after which there are at times many left which stand for seed. This is esteemed a loss, as they are less profitable in this state than while they were green, and only happens from a scarcity of hands. When these are in plenty, they are picked clean, the pea-haulm is immediately cut up with hooks, removed on to every fifth ridge, or into a grass-field, where it is cured and put into stacks, for horse-feed, and the same land is prepared as speedily as possible for turnips.

The grey, and other late pease, stand to ripen their seed; they are then cut up with hooks, rolled into wads, turned once or twice till they are cured in the field, and in that state are carried home, and put into stacks.

8. *Thrashing.*—All done by the flail.

9. *Produce.*—The grey pease that stand to be ripe, vary very much in their produce; though an average crop is about 30 bushels per acre.

The white pease are sometimes sold from 7*l.* to 9*l.* per acre in the field; the buyer taking every risk and expense on himself: the produce varying from 10 to 50 sacks; and

and the expense from 30*s.* to 5*l.* I am not sufficien acquainted with the subject, to give the average of t county with any thing like accuracy; but I suppose it be about 25 or 30 sacks, which sell at from 8*s.* to 1 producing about 18*l.* per acre.

10. *Appropriation.*—From what has been said it is e vious, that an astonishing quantity of the white sort : eaten by the inhabitants of London, in the agreeable st of green pease. Such of them as become ripe, are par used in soup and pease-puddings; the residue are boug by the millers, who grind them with inferior wheat in meal, that is afterwards sold to the bakers, who, witho a blush, imprint the loaves made of this and other mix flour, with the letter W, thereby falsely certifying th such bread is made of the genuine produce of wheat.

For further observations on green pease for the Londo markets, see the Section on Kitchen-gardens; and M VANCOUVER's Essex, p. 89.

VII. POTATOES.

Most of the farmers in this county, and such of th cottagers who have gardens, grow potatoes for their ow use, but few or none for sale.

The management of a potatoe crop, in one-bout ridge is accurately and fully described in Mr. TUKE's Repo of the North Riding of Yorkshire; and by Sir JAME KIRKPATRICK, in the Appendix to the Dumfries Repor It is, indeed, the only mode in use to any extent, in th Northern Counties of England, and the adjoining ones i Scotland; where they excel in the cultivation of this roo

i

in rows about 30 inches apart. They will do well to continue this practice, as there is no better known.*

Potatoes intended for sets, should be grown without dung on a rich soil; and on a poor soil, with less than usual; and with less earthing up, in order to prevent the curl; which is now, I believe, known to be occasioned by the sets being grown under a system too rich and forcing. See, on this subject, two or three of the volumes of the London Society of Arts, &c.

For strong land, potatoes are an improper crop. A rich sandy loam is the best; though they are particularly suitable for a dry soil in a moist climate, yet they may be grown on every soil of a loose texture. On light land, or loamy sand, regard should be had to the depth of the topsoil, the nature of the subsoil, the climate of the district, and the general dryness of the land. On all very dry sands, in a dry climate, the land should be kept quite flat, and the plants should be hoed by hand, as the only means of preserving the ground sufficiently moist to promote the growth of the crop. But in every situation, where there is no danger of the land being too dry, and on all thin soils, one-bout ridges have the advantage over every other method. This way of laying up the land doubles the depth of the staple, concentrates the manure, and admits of the soil being kept more clean, and in garden-like culture, than any other which has yet been used. This mode too, it should be observed, is particularly applicable to all moist climates.

The sound doctrine contained in the foregoing observations has been established with me, after being fully experimented. And as they apply with equal force to the culture of turnips, it in some measure accounts for the

* For the time of planting, see the Report of Roxburghshire, p. 98.

two opposite methods of cultivating these crops, in the South-East and North Districts of England. In each of these districts, the farmers are, very properly, tenacious of the superiority of their own method.—(See Section Tillage, Sandy and Clayey Soils.)

In the Section on the Rotation of Crops, I have urged the propriety of growing potatoes after tares or early peas are off, and in the same year. Potatoes and wheat alternately, would raise a very large quantity of provision, and support an extraordinary great population; but a crop of winter tares, or early pease, or early cabbages, may be made to succeed wheat, and be off the ground before it be wanted for potatoes. By this means, three most capital crops are now procured by several farming gardeners at Kensington, Fulham, and Chiswick, and this beneficial practice is capable of being extended to every part of South Britain.

Potatoes seem to produce about ten times as much in measure per acre as wheat. The quantity of starch contained in them is about one-fourth part of their entire weight. Sixty-four hundred weight is as moderate a quantity of starch to be gotten from one acre of potatoes, as sixteen is from an acre of wheat. The latter yields about 56lbs. of starch from every bushel of corn.

VIII. TARES.

Many of the farmers in this county grow a few acres of tares, and the culture of them is extending every year, from the circumstance of their importance becoming better understood. It is a considerable degree of gratification to me, to have been the first who sowed them on a large scale, and publicly recommended them to the notice of farmers,

farmers, as highly deserving to be introduced into a regular rotation of crops*. After a dozen years' more experience of their utility, it is impossible for me to say so much in their favour as they deserve. *They may be made the principal means of enabling the arable farmer to support as much live stock as the grazier. For during the time they occupy the ground, they produce more green food of the best quality, per acre, than Romney-marsh or Pevensey-level; and the ground may be cleared of them in the month of June, in such good time as to admit a crop of clean turnips, or of potatoes, in the same year; or of being prepared and sown with wheat: and even after the turnips or potatoes are off, the ground may be prepared, and sown with either wheat or other corn. Tares support cattle; will make both sheep and bullocks of every size and breed fat; they suit every situation, and will flourish on all the variety of soils in this country. They do not depend on any particular market; and, above all, they manure the land fit for the immediate reception of turnips; whereby a succession of green crops can be kept up, that would fatten a very increased quantity of live stock, and be the means of raising, in situations the most distant from towns, an abundance of those great sources of fertility, dung and urine. A judicious combination of tares with turnips, clover, and sainfoin, may be the means of rendering our poor sheep-walks, downs, and wastes, of from ten to thirty times their present value to the community*†.

1. *Preparation.*—If the land be poor, or at least not

* Vide my Letter to the Society of Arts, &c. in the thirteenth volume of their Transactions, for which communication I was honoured with a Medal by that respectable body. And the Board of Agriculture unanimously voted me their Thanks, for my Letter to them on the same subject.—*J. M.*

† Mr. WESTERN says, sheep must be watched at first, or many will die, especially if the tares are wet when they are put to them. He adds, that pigs are very fond of tares.

rich,

rich, manure it, otherwise not; plough it thinly into ridges well calculated to keep it dry; sow broad-cast, and harrow in the seed.

2. *Sort.*—There are three sorts; the winter tare, the spring tare, and the white tare. The first is the most sown, and is sufficiently hardy to stand all the changes of weather, even the severest degrees of frost ever experienced in England, or, I believe, in Great Britain*.

3. *Steep.*—None used. Though, for sowing in August, or any dry season, it would be advisable to steep the seed.

4. *Seed—(quantity sown).*—In the middle of the season about two bushels and a half, on soils moderately rich; but early sowing and rich soils require less seed than poor soils and late sowing.

Many persons sow a little rye among winter tares; and some intelligent men sow a small quantity of barley among spring tares.

5. *Time of Sowing.*—From the middle of August till the middle of October. If the land be poor, or the situation exposed, by all means sow early, even in August; and in all cases, it is advisable to sow at different periods—early, medium, and late, in order to have a succession of them for feed the ensuing spring. Spring tares, and the white sort, may be sown at any time during the months of March and April.

---

* Those sown in August 1794, stood the long and severe frost of the following winter perfectly well, on my farm.—*J. M.*

6. *Culture*

6. *Culture.*—A light roller should be drawn over them uring the first dry time in March, to prepare the ground r the scythe; and the most rank weeds should be awn by hand in April.

7. *Harvesting.*—They begin to blossom in May, and om that time, I am of opinion, the farmer's stock should e wholly supported on them till the blossoms begin to all off, and the formation of pods to take place; at which ime, all that are left should be made into hay, unless pods should appear in large quantities, and supposing them to be of the true winter sort. The farmer should in that case reserve seed enough for his own use; otherwise he should make them all into hay. If the land has been dunged, and the seed good, there will probably be a crop of twelve tons of green tares, or three tons of hay; and, provided they are well cured, it will be the best hay on the farm. But tares require a considerable degree of sun. Rain is very injurious to them. In case a continuance of wet weather should happen after they are cut, it would be difficult to make them into hay at all, at least of a good and salutary quality. On account of this risk, I would recommend that all the stock of a farm should be soiled on them green; and in doing so, it will necessarily have the good effect of taking the stock off the grass land long enough to allow of its being mown for hay. By this means the farmer's meadow hay will be much increased in quantity; he will not have occasion for pasture (the tares abundantly supplying the place of the richest pasturage), and by the time that the cattle return from green tares, the grass land in the mean time having been mown, will be ready to receive them. I conceive that I may justly be allowed to estimate the value of tares, as if they were all made into hay. This will be the case with a

great

great part of them, and the rest will preserve an additional quantity of meadow hay, perhaps equal to their own weight.

Spring tares produce rather a lighter crop, and are subject to much risk from a dry summer. There is no difference in their application, or value per ton; but the spring sort coming a fortnight later, it seems to be convenient and advisable to grow some of each sort, and to have a succession of them for green food all the summer.

As to the manner of giving them to cattle, it would be wasteful in the extreme to turn live stock into a field of tares, as their treading and lying down would do great mischief to the crop, even by feeding it in small patches hurdled off. The most advisable method would be, to mow the tares off the first half acre, and to carry the produce into the stables, cow-houses and cattle-yards, or on to poor land, to be consumed by stock. Then to hurdle the growing tares from such *cleared ground*, into *which* put the stock, and feed them all with the tares, given to them in racks*, removing the hurdles and the racks forward daily to the edge of the growing tares; which will manure the land uniformly, and deposit all the urine in the soil. In the Vale of Evesham, the crops of clover and tares are principally mown, and given in small bundles to draught-horses tethered regularly over every part of the land which produce these crops. The dung, and principally the urine of the horses, being by this means deposited and absorbed into every part of the land, creates great fertility, and enables it to raise a prodigious crop of wheat.

* Racks and cradles are equally useful for sheep, and cribs for larger cattle.

8. *Thrashing.*

8. *Thrashing.*—The seed thrashes out very readily by the flail.

9. *Produce.*—I have weighed a sufficient quantity of green tares to know, that the produce was twelve tons per acre; and when made into hay, it was three tons; which in this county is worth fifteen guineas per acre. In more distant places, where meadow hay sells from fifty shillings to three pounds per load, the tares will be worth from seven pounds ten shillings to nine pounds per acre. The price of seed tares varies, from five shillings to twenty-one shillings per bushel. A neighbour of mine, who grew tares on my recommendation, permitted one field to stand for seed: it produced upwards of forty bushels per acre.

White tares are but little known; they are of the complexion of white pease, and may perhaps hereafter be used for some of the same purposes. It is said, on the experience of three years, that if they are sown on the same day, and on similar land, with the best grey spring tares which can be procured, they will be podded before the others are in blossom.

NOTES.

'By one crop of vetches succeeding another, Mr. HALSTEAD, of Lavant, Sussex, ensures a crop the whole summer, of the best food that can be given to cattle: after this he sows turnips; then wheat.'

'Tares are of such infinite importance, that not one-tenth of his (Mr. DAVIS, of Beddingham, Sussex), stock could be maintained without them: horses, cows, sheep, hogs, all feed upon them. Hogs are soiled upon them, without any other food. This plant maintains more stock than any other plant whatsoever. Upon one acre of tares Mr. DAVIS can maintain four horses in much better condition than upon five acres of grass. Upon eight acres he has kept twelve horses and five cows for three months (June, July, and August), and no other food given them.'

. 'No artificial food whatever, is equal to this excellent plant, at East-bourne.'

'They find this crop to be a hearty and most nourishing food for all sorts of cattle. Cows give more butter when fed with this plant, than with any other food whatsoever.'

IX. TURNIPS.

Turnips are undoubtedly the basis of the best husbandry, and, in every part of this island, they will always be a principal crop in the most improved methods of cultivating loamy sands. They also grow very well on well drained black peat-earth; and on such strong loams as are rich. They support and make fat a very increased quantity of animal food, and, *by the dung and urine of fat cattle, the land becomes more highly enriched than by any other means.* It is an advantage of great importance, that they require such late sowing, as to give the farmer an opportunity of reaping *two green crops* on the same land in one year, both of which may be fed by cattle. *A succession of these crops (tares and turnips*) may be raised and consumed on dry land, till it acquires any desired degree of richness; and will feed more bullocks and sheep than the best grass land in the kingdom†. And what is of great consequence, it will be perfectly clean, and fit for every sort of corn during the whole time. But they are crops that are perfectly incompatible with common fields,* and for that reason, more than any other,

* Turnips grow very well after early pease, or being sown among hemp or flax.—*J. M.*

† Romney-marsh feeds five or six sheep, per acre, per annum. An acre of loamy sand, only moderately rich, cropped with tares in the spring, and turnips in the autumn, would fatten twenty of the same sheep.—*J. M.*

they

they are so little grown in England. *Enclose the common fields, and the tare and turnip husbandry will become general; which will be the most effectual means of loading our shambles with meat, and filling our granaries with corn.*

The broad-cast method of growing turnips is the only one made use of in this county. They are invariably twice hoed by the hand, and are mostly consumed by cows*, whose owners buy them growing in the fields, at every distance short of twelve or thirteen miles from London, at prices varying from eight to ten or twelve guineas per acre, according to the length of carriage, and quantity of the crop. The cow-keepers are at the expense of pulling them up, loading and carting them home, which is generally done in waggons drawn by six stout horses, in loads, that, for their largeness, surprize every beholder†.

In the South of England, the broad-cast method of growing turnips is the only one known; but in several counties in the North of England, and South of Scotland, the more intelligent farmers grow them *in one-bout ridges*‡. The two modes are certainly widely different, but there are particular soils, and climates, which make them both perfectly proper.—(Vide the tillage of wet land, and the cultivation of potatoes.)

The broad-cast method of growing them, among the gardening farmers within four or five miles of London, is perfectly unexceptionable; both on account of the rich-

* Gardeners, and some of the poorer farmers, send their turnips to Covent-garden, and other markets, for the use of the inhabitants of the metropolis.—*J. M.*

† To the manifest destruction of the roads.—*J. M.*

‡ They are thus grown in Northumberland, Cumberland, Durham, the North Riding of Yorkshire, the Lothians, Dumfries-shire, Annandale, Roxburgh, and some other places in Scotland.—*J. M.*

ness and depth of their cultivated soil; and it is so on all highly enriched soils of a foot or more in depth, which have a subsoil of dry sand or gravel; also on light land in every climate that is too dry and burning. The west side of this island, however, is sufficiently moist, even to two-thirds of its width; and for that reason, is most admirably calculated for the production of root-crops in one-bout ridges.

Turnips, it is well known, have a tap-root of a foot or more in length, and the greater part of the soils in this kingdom, when laid level for a crop, are only six or seven inches deep to the subsoil; of course, the superstratum being only half the depth which the roots require, has the effect of stunting the growth of the plants. In order to remedy this defect of the soil, the land should be laid up in one-bout ridges, and the seed should be covered in on the highest part of such ridges. This operation rather more than doubles the natural depth of the soil, and quantity of pasture, where the turnips have to feed and grow.

Another great advantage to the success of the crop, is obtained by one-bout ridges, namely, confining the manure to less than one half of the space necessarily occupied by it in the broad-cast method. This concentration of the manure to the spot where it cannot escape the feeding power of the plants, cannot fail of forcing the growth of the turnips to a size much larger than by the broad-cast method; it also pushes them forward much faster, which is frequently of considerable importance. Further, the hoeing and weeding the rows of all turnips so grown, can be perfectly well done by women and children, and a light swing-plough can be occasionally employed in the intervals; at once destroying the weeds, and earthing up

the

he plants*: consequently, with the foregoing exceptions, the method of growing turnips on one-bout ridges† is eminently superior to every other practice, as to the cultivation of this invaluable root.

The danger likewise of sheep casting themselves in the furrows, seems to be lessened, or totally removed, by the drill method of growing turnips; for on one-bout ridges sheep cannot lie down on their sides, or roll on their backs, as they sometimes do on ridges and furrows under the broad-cast system.

This method of growing turnips I earnestly recommend to the farmers of these kingdoms, as more gardenlike, and indeed preferable to every other, except in some few situations, as aforesaid. It is equally applicable to beans,

---

* Turnips have a long tap-root (sometimes two feet three inches long) which shoots below the cultivated soil, and must greatly depend on the substratum for its nourishment. Very often, the roots getting through the cultivated soil, are obliged to crawl about for food on the hard surface of the substratum, where nothing but starvation, and all her train of ills, is to be expected. The first object, therefore, is to give a much greater depth of cultivated soil to the roots of the plants, which is most effectually done in one-bout ridges, after the land is prepared, and the dung spread, as usual. Mr. Murr's drill-plough, with two mould-boards at once going, forms the ridge with the dung in the centre of it, makes a drill, sows the seed, and covers it. The plants being reduced to proper distances with a short hoe, a man and an old horse, with the same plough, may hoe four acres a day, pare the sides and bottoms of the furrows, mix the soil, lay it up to the plants, and leave not a weed to be seen. Turnips so grown, exceed in weight per acre the broad-cast method 50 per cent.—(See a plate, and description, in the Annals of Agriculture, vol ix. p. 432 to 443.)

† One-bout ridges are particularly applicable to every soil and climate that is too moist for the broad-cast method; for, let the season be ever so wet, the crops on these ridges are sure to be of a proper degree of dryness.—*J. M.*

cabbages, potatoes, and perhaps carrots, parsnips, pease, and tares.

1. *Preparation.*—In this county, there is no such thing as turnip-fallow: the land invariably produces a crop in the spring, before the preparation for turnips; generally of tares, early pease, or rye. As soon as the preceding crop is off, the land is usually ploughed very thin, then harrowed, and the weeds, stubble, &c. raked into heaps and burnt. It is then cross-ploughed a full depth, harrowed, and the weeds raked and burnt as before; and lastly, it is ploughed into ridges of four or five yards wide, harrowed, then sown broad-cast, and the seed covered by another very slight harrowing.

For the method of sowing turnips on one-bout ridges, see the note in page 261, and the Northumberland and Cumberland Reports.

2. *Sort.*
3. *Steep.*
4. *Seed.*

Those sorts that root deep, and grow the most under ground, or are moulded up, are the more secure against frost. The straw-coloured turnip is much sweeter tasted, and the red more bitter, than any of the other colours; of which there are varieties in every field. The quantity of seed is rather under two pounds per acre, sown without steeping; but it would be better in a dry season to steep the seed, especially on late sowing.

There is much difference in the sorts of turnips, both as to size, shape, hardiness, and their containing more or less of the saccharine matter. The seed usually on sale cannot be expected to be of a uniform quality, nor to possess more than a medium of any valuable property; therefore, in this, as in all other things, the only way of obtaining

obtaining the best turnips is, by growing your own seed; and that should only be raised from such plants as contain every desirable property in the most eminent degree. In order to do that with the best chance of success, select the largest plants which have those qualities, and have withstood such frost as destroyed ninety-nine in a hundred. These hardy turnips should be collected in the spring, and transplanted into a garden, or at least, into land that is rich and well tilled. It is obvious, that the seed which might be raised from such plants, would possess the qualities of their parents, and produce turnips of a superior kind. By repeating the practice annually, of collecting the most promising plants raised from such selected seed, any person may, in a few years, raise turnips to a very high degree of perfection.

5. *Time of Sowing.*—They are sown as early, during the months of July and August, as the ground can be cleared of its former crops, and prepared for turnips. The first sown produces the largest crops, and should be first eaten: the last sown will stand the frost better.

Turnips sown early in this part of England, as in June, or the first fortnight in July, are very subject to mildew, which disease frequently destroys the crop. If they escape that danger, the circumstance of their forming their bulb more above ground than such as are sown late, exposes them more than usual to the destructive effects of frost; and as they are particularly susceptible of it, they seldom escape. But even without mildew or frost, they are the first to decay: they are only in perfection at a time when every grass-close abounds with sheep-food; therefore, they are sometimes reduced to a putrid state, and ploughed in as manure.

Turnips sown in the last fortnight of July, or early in

August, on land in good heart, form their bulb deep in the ground than such as are sown early; they are mo solid, and resist frost much better. They are usually f for the purpose of sheep by Christmas, and continue i pretty good perfection till April.

6. *Culture and Sale.*—Answered as above, as far as th county is concerned; but for more distant places, it ma be useful to note, that when eaten by cattle and sheep i the field, they pay from 2*s.* 6*d.* to 4*s.* 6*d.* a ton; that i a crop of twenty tons will produce, in beef and mutto from 50*s.* to 4*l.* 10*s.* exclusive of the dung and urin which is worth about 50*s.* more; in which manner th whole produce varies from 5*l.* to 7*l.* per acre. The sa turnips, on being drawn, and given to similar stock stalls, sheds, and cattle-yards, would yield more l about 1*s.* per ton, or 1*l.* per acre; but the latter adva tage is much more than drawn back, by the loss of t cattle's urine, and by the expense of carriage, attendan and returning the dung on to the land, when greatly r duced both in its quantity and quality.

In the operation of pulling up turnips, within th county, the labourers always break the tap-root off: it supposed not to be worth carriage; and such roots oug in every case, to be broken off, for the sake of leaving t manure and mould which hangs about them, in the fie

When turnips are wanted for spring feed, the followi method will be found to preserve them through t months of March and April, without any great dimi tion of their capacity for the feeding of cattle; and con quently, it will be the highest folly in all turnip-farm not to avail themselves of it. The method is this: dr the turnips by hand, break off the tap-roots, and le them on the ground; cut off the tops, and serve them

cat

stale in the yards; pile the bulbs in ridges made parallel to each other, the length of the close, in such a manner, that a cross section of any one of them may form a triangle of equal sides, which measure about six feet each. Then cover the whole with straw, stubble, fern, rushes, or the haulm of potatoes, pease, or beans; and over that place mould, six or eight inches in thickness, which beat and make smooth by the back of a spade. The mould should be dug near the sides of these pies, which, if properly done, will make a drain, that should be continued round them, and communicate with a ditch to carry off the water. When the preserved turnips are wanted, open the end of one of these pies, and spread as many as may be necessary; then close the place with the straw that has been removed, and repeat this every twelve hours. In this manner turnips may be preserved from frost, and be eaten with more ease by cattle, afford much more nourishment, and the farmer will have the certainty of their continuing good until they may be wholly consumed.

No farmer ought to neglect this method of preserving one-third, or even a moiety, of his turnips; but in case a severe frost should set in sooner than might be expected, and before they are secured as aforesaid, he should double his exertions to get as many secured as possible, before they are so much frozen as to be in danger of much injury from a thaw: then confine the sheep on those that are abroad and exposed. When these become so much frozen that a thaw would be the certain destruction of them, they may be kept, in the frozen state, in pies of the same kind (but larger) as I have before described, mixed with such snow and ice as may happen to hang about them. These should be thatched, and secured from a thaw, in the same manner as I have just advised fresh turnips to be secured from frost.

The frozen pies may be preserved till the latest period in

in the spring in which turnips can be wanted. This provident care may be the means of furnishing the month of April with abundance of green food, supplying plenty of milk to ewes and cows, and of wholesome diet to man—other cattle.

Carrots have been preserved and used in a similar manner, but they were bedded on straw; and no doubt can be entertained, but parsnips may be so preserved and used.

When it becomes necessary to make use of this frozen heap of turnips, they should be given to cattle, after the frost has been extracted, by putting them in cold water.

An English physician (Dr. KING) who resided eleven years in Russia, informs us, that if a cabbage be thoroughly frozen, it may be kept as long as the freezing medium can be kept up; and it may at any time be thawed in cold water, when it will be as fresh as if just gathered out of a garden; but if it be thawed in hot water, or by fire, it becomes so rancid and strong that it cannot be eaten. The inhabitants of Russia preserve fish, poultry, veal, and every sort of animal food, in a frozen state, without salt; and they have any portion of it quite fresh at any time, by the simple operation of thawing it in cold water. Therefore, a farmer need not be under any apprehension of loss by his turnips becoming frozen; he has only to preserve them in that state till near the time of using them, then thaw them in cold water, and give them to his cattle.

Healthy thriving cattle have the power of converting turnips partly into mutton or beef, and of changing the residue of them into such a quantity of manure, as may be sufficient to enable the land to bring to perfection a crop of corn. These animals are far from adding to the land; on the contrary, they carry off an excess of nearly 250lbs. the increase in their own weight, from every acre of it; and yet the soil is enriched by their preparing the residue of the turnips, without the aid of putrefaction,

to

to mix with it in such a manner, as to be taken up by the roots of the next crop of corn. But when turnips are destroyed by thaw at the going away of frost, they become so very putrid, that few things are more offensive; in which state they should be ploughed in, and mixed with the soil. Such a putrid mass not only promises, in the way of theory, to be good manure, but experience has ascertained that it is so.

Turnips rotted, and ploughed in as manure, are probably a very efficient, and the cheapest dressing for arable land. It is well known that rotten turnips have a very offensive smell, and as it is a sound opinion, that every stinking thing is good manure, they cannot fail of being so. Therefore, sow turnips over a much greater extent of land than usual, even on adhesive soils. When they are grown to their full size, pen sheep on them in the usual manner. In case the land should be of a wet or clayey kind, only keep the sheep on it during every dry time in winter, or at such times as they can be there without poaching so much as would injure the soil or the flock. When the turnips are either eaten, destroyed by frost, or it becomes time to plough the land for the next crop, then split with a spade, triangle, or cross, all such turnips as have escaped being mortally wounded by the teeth of the sheep. Plough the land clean, turning in what has fallen from the sheep along with the rotten and wounded turnips; then sow it with such corn as may be the most suitable for the soil and the season, which will generally be, in February, wheat; in March, oats; and in April, barley.

Sheep should feed turnips in the usual manner, in small patches hurdled off, removing the hurdles, in order to allow them fresh food daily, which will improve them to the utmost, and deposit the dung and urine uniformly on the

the soil. On such very dry sand or gravel as will bear, without injury, the treading of neat cattle, they may be penned in the same manner as sheep, but the turnips should be pulled up, and served to the cattle in cribs.

The system of drawing turnips, removing the tops and tails off them, and preserving them in pies, buildings, yards, or large cellars (which last may be made for that purpose, as is sometimes the case with the growers of potatoes), would enable the farmers to take them off the land before the end of February, which will give them more time to till their ground. It will save the land from being exhausted in the spring by turnips; will keep them sound, and capable of giving the utmost degree of nutrition to cattle, while wheat, or greater crops of barley, may be raised by being more early sown, and upon land in better heart.

The turnip has three powerful enemies, namely, the *fly*, the *slug*, and the *black canker*. The attack of the *first* may be known by the seed-leaves having many brown spots, occasioned by the fly having eaten the fleshy and green part of the leaf, down to the fibres—these usually increase in number and size, till the plants are destroyed. The method of growing turnips in one-bout ridges, as recommended in page 261, has the effect of a hot-bed; in pushing them so speedily through the seed-leaf into rough-leaf, as to contribute towards securing them from the fly.

I believe the *slug* is even more destructive than the fly; the ravages of which are distinctly marked, by its feeding on the edges of the seed-leaves, eating one piece after another, till the leaf is wholly consumed. On the view of a field of young turnips attacked by slugs, some of the leaves have lost a quarter, others one half, three-fourths, or the whole; so that the stalk only has been left. A

flock of sheep kept in motion by a boy and a dog, and also night-rolling, have been used as palliatives.

For the effect of train oil, in pushing turnips forward, tainting the seed-leaf, and securing them from the fly and slug, see the fifth volume of the Transactions of the Society of Arts, page 38; ninth volume of Annals of Agriculture, page 389.—Water in which tobacco-leaves have been steeped, might be showered over the land from the tail of a cart, to render the plants nauseous. Soot has been sown with the same intention.

The *black caterpillar* makes its attack on the rough leaf after the turnip-tops are considerably advanced; in which case ducks have proved effectual for destroying them, in the proportion of not fewer than four to an acre*.

Query—Whether any, or all, of these vermin, feed on the seeds of plants; and whether they might be destroyed by poisoning and sowing such seed?

The fly which produces the caterpillar, might be kept off by any thick offensive smoke being made to pass over the turnip-field; but to discover the coming of the fly, would require more watchful attention than can be given in large concerns; nor would the wind be always favourable for the purpose. Perhaps the best method would be, for the farmer always to have in readiness a stock of barley chaff, sufficient in quantity to sow the whole of his turnip land, on the first appearance of either the caterpillar or the slug: it would be effectual against the slug immediately after being sown, and against the other, by shaking them from the plants to the ground by a light push-harrow.

There is much reason to suppose the mischief done by

* For much information as to this caterpillar, see MARSHALL's Norfolk, vol. ii. page 291, &c.

the

the fly is occasioned by laying crude manure on the land a short time before sowing the turnips. It is certain, that during every summer, the dung of neat cattle is partly consumed by small black beetles; and the dung of horses is usually devoured by flies. The manure which accumulates in cattle-yards, from the mixture of several sorts of animals, generates myriads of insects of many sorts; and as it is much too generally carried on to the land before it has undergone the putrid fermentation, it may be expected to abound with insects and their eggs (as well as with the seeds of many weeds), and it is highly probable that the turnip-fly is among the number. Spreading the contents of a farm-yard on land before it be thoroughly reduced, is sure to stock it with insects and weeds, both of which may be prevented by turning the dunghill, and occasioning such a degree of heat in it, as shall be sufficient to decompose the whole into a uniform mass of rich manure. Therefore it is advisable, to have all such manure as may be intended to be carried from the cattle-yards to the field under preparation for turnips, thoroughly reduced before it be laid on the land.

SECT. V.—CROPS NOT COMMONLY CULIVATED.

I. RAPE, OR COLE,

Is not commonly cultivated in this county, though a plant which produces green food in great quantity, of the most nutritious quality, and may be so managed as to be in perfection in March and April; months which, more than all others, are supposed to try the skill of the farmer for the means of supporting a large stock of live cattle.

Where this crop is consumed green on the soil, it is equally beneficial to the landlord and his tenant; but suffering it to perfect its seed, would be putting a considerable sum of money into the pocket of the tenant at the certain expense of his landlord.

The richer the land, the more suitable it is for rape. A friable loam does well, adhesive clay does not suit it, and thin-skinned poor land is wholly improper; but marsh-land, fen-land, and any old pasture whose vegetable mould is not thin, produces great crops of it. Cole succeeds well as the first crop after paring and burning; and when it is fed by sheep, the land is in that manner put into high condition for potatoes or corn. If the land be not fresh, or in good heart, it should be manured plentifully; and if it be weedy, it should be fallowed, Any land already in aration, and free from weeds, should be heavily manured; then it should be made to bear a crop of autumn-sown tares, and they should be eaten on the same land, which might then be prepared for cole; or the manure may be delayed till the tares are eaten off, and then spread on the land. It seems to be advisable to prepare the soil, and cover it thinly in narrow one-bout ridges, to be horse and hand hoed, in the same manner as I have advised for turnips. When the intention is to let it stand for seed, it may be sown from a week before, till a week after Michaelmas; but for the support of sheep from the middle of August through the winter, it must be sown from ten days before, till any time after Midsummer.

Sheep feeding on cole gorge so much, that they should be protected against every degree of disturbance. A gunner following a brace of spaniels or pointers through the close, would generally occasion their running two or three score of yards, which is supposed to be sufficient to kill several of the sheep; but if a pack of hounds, and their followers,

followers, were to pursue their game through a close cole in which sheep were fattening, it would occasion the sheep running so much, as to be the death of many of them; perhaps a moiety of them would in this manner be destroyed in ten minutes by the frolic of a hunter.

II. GREEN BOOR-COLE, AND PURPLE-COLOURED BOOR-COLE.

These plants, like rape, require land that is naturally rich, or that has been made so by art. The soil may be prepared in the same manner as I have described for rape; it should, like that plant, be laid into one-bout ridges, and they should be horse and hand hoed. These plants resist every common frost without being injured. Sheep may be turned into a whole close of them without putting the farmer to the expense of wattles. The bite of sheep is not of any disservice to these plants, for they throw out fresh sprouts wherever there may be one taken off. They are in perfection in March and April, and afford a great deal of good food.

III. TURNIP-ROOTED CABBAGE,

Is another plant which is naturally adopted for the support of cattle during the spring, though not raised in any part of this county. This plant is most certain and valuable for sheep and cattle feed during the months of March and April, or even later; and the best way of cultivating it, as to the time of sowing, and every operation, is the same as for turnips in one-bout ridges.

IV. THE SWEDISH TURNIP,

Is not grown in this county, though it is of very great importance on every well-regulated farm. It arrives at perfection in the spring, when other food is growing scarce, and when ewes, cows, and mares, have more than usual occasion for succulent food. The Swedish turnip is as good food after January as other turnips are before; therefore, it is capable of superseding the use of the latter after frosty weather, and consequently, of saving the straw, labour, and expense, of preserving them in pits.

This plant should be sown on land well manured, and in fine tilth, in one-bout ridges. The preparation of the soil, and cultivation while growing, should be the same as for common turnips, only this requires to be sown much more early, namely, from the middle of May till Midsummer: May is supposed to be the best season. The Swedish turnip is a slow grower, and will not acquire its full size till the end of January. A person may then draw them, cut the tap-root off, and lay them down to be eaten in the field, or they may be carried off, and spread in a dry grass close; or, as they are good for hogs as well as horses, many of them should be carried to the yards. They do not require being covered, or any other protection from bad weather, but may be occasionally laid in heaps, and afterwards spread abroad, to suit the convenience of the farmer. Notwithstanding many of them will be bitten by different animals, they will remain perfectly sound all the months of March and April, or even later.—For further particulars of the merit of this turnip, see the Views of Roxburgh, Nottingham, and Herts.

V. LUCERNE.

There are several persons in this county who cultivate an acre or two, or three, of lucerne, for giving it green to horses: always in drills, in garden-like cleanness, and highly manured. It is usually mown four times in a summer.

VI. CHICORY.

I have not been informed of any being grown in Middlesex; and have tried it only on a small bed in a garden, where it grew with great luxuriance, and bore repeated cuttings in the course of a summer. But as it is said to require a much lighter soil than any which I occupied, and as my object was to lay my land down for the growing of hay, I did not extend its culture.

VII. LIQUORICE,

Is cultivated by gardeners at the Neat-houses near Tothill-fields, to the extent of a few acres.

VIII. HOPS.

The only hops grown in this county are about 20 acres adjoining the Uxbridge-road, at the distance of two or three miles from Tyburn. They belong to Mr. RANDALL, who is said to have hop-grounds at Farnham, are very well managed, and tolerably productive. The land of this

ty is not generally suitable for hops; they suc-
:r in a rich loam of two or three feet in depth,
limestone, rubble, or other calcareous subsoil,
y divided or porous to preserve the soil mode-
r, and to permit the roots of the hops to extend.
: hop-gardens near Farnham, Maidstone, and
ry, are of this description, and several of them
eyond memory. Wherever sainfoin is seen to
nd endure, there it is highly probable hops might
d with safety and profit; except that hops re-
be screened by higher ground, lofty hedge-rows,
tions, from strong winds.

IX. COLOURS FOR DYEING.

bstitute for madder, from ladies' bed-straw, being
ir own indigenous plants, was introduced in the
9, into the nursery-grounds of Mr. WILLIAM
, at Bow, by the discoverer, Dr. C. GORDON;
authorized by the Lords of the Committee of
uncil for Trade, to hire one or two acres of land
ultivation of the madder plant, in order to ascer-
hat degree it is capable of improvement, and at
pense it might be cultivated. Various experi-
ere made from time to time, to ascertain these
d they have been in general sufficiently satisfac-
he plant is found to increase, in all its parts, to
one-third more by cultivation, than when wild
ultivated in the open fields, and that without
its colouring qualities. To effect this, however,
deep, and dry land, is indispensably necessary;

which, by a due management, equally plain, easy, and simple, will, at the termination of the fourth year from the planting out, produce a crop of three to four tons on every acre. The colour that this root gives to woollen goods, when duly prepared, is truly elegant, and approaches nearer to the scarlet of cochineal than to the red of madder, which, in comparison, sinks to a species of unsightly brown. The top part of the plant answers the purposes of *weld*, and gives, particularly to cotton and linen, an elegant and durable yellow. The tops may be annually cut down, without prejudicing the roots, and may therefore be sent regularly to market, and made to reimburse the cultivator a portion of his expenses.

'Ladies' bed-straw is an indigenous plant, or native of Great Britain, and effects a light, deep, and dry land. The root is the most marketable part of the plant, and runs deep into the ground, sometimes even to six feet, if not prevented by want of proper earth, or some other very material cause: so circumstanced, the tap or main root commonly divides into a greater number of smaller ones, many of which being lost in manufacturing the article for market, causes a short crop: in general, however, one acre of suitable and ordinary good land, being deep and well ploughed, may produce from three to four tons; and one ounce of the seeds, sown on beds, to be covered with glass frames in times of frost, will produce plants sufficient to plant out that acre.

'The seed may be sown in April, and will come up in ten days, or a fortnight's time, and, in two months after, is fit to be planted out; which, for the convenience of hoeing, a labour that must be duly attended to for the first and second year, and to prevent the lateral roots from interfering

interfering one with another. [illegible] be [illegible] at the distance of eighteen or twenty inches [illegible]

'In about four years from the above period the roots will, without any further trouble than occasionally hoeing, be arrived at their proper point of maturity, at least to that degree of perfection the situation of the land to the plant can admit of, and therefore should be taken up; but in no greater quantity at any one time, than may be with ease cleaned of the earth, and in particular, of a dirty black skin, or bark, which hangs loosely about them, being highly pernicious to the beauty and elegance of their colouring particles, and that may be effectually done by softly rincing them in pure, and, should convenience serve, running water. This being effected, and wiped thoroughly dry, they are immediately put into a stove, previously brought to that degree of heat which stops fermentation, without injuring, or any ways scorching the remaining fine bark. When thus perfectly cured, they are, without loss of time, brought to the mill, in order to prevent their imbibing the moisture of the air, which they greedily will, if permitted to do, and there put under a stone, on edge, to be ground down, and immediately casked up. The casks, during the time of filling, are, from time to time, to be duly and regularly pressed by weights as heavy as the casks can bear.

'The longer the article remains in the cask, the dyers may like it the better; nor will they purchase madder until two or three years, or even more, thus casked up, if they can be otherwise served; and as the substitute has a very great affinity to madder, and its roots more solid by far than those of that article, it is to be presumed they must require an equal time "to make in the cask," as the dyers phrase it, that madder roots do.

'The tops of the substitute, if cut down about the latter end of June, when nearly in full bloom, will answer all the purposes of weld, particularly in dyeing cotton and linen, and is to be cured and brought to market in the same manner as weld. It effectually curdles milk, and gives cheese a peculiar, but very agreeable flavour.

'The scarlet of cochineal, and a specimen of the colour which the substitute gives to woollen goods, together with that given by madder to such, do all accompany this. Comparison will shew, that the colour of our substitute comes so very near the scarlet of the cochineal, that it loses but little by the comparison; whereas, the colour which madder gives is, by a like comparison, visibly sunk towards a brown.

'Madder is sold at the average price of 6*d.* per pound, or 56*l.* per ton; and cochineal at 15*s.* per pound, or 1680*l.* per ton, which amounts to thirty times the price of madder; yet a pound of madder dyes two pounds of cloth a good deep colour; and a pound of cochineal dyes but sixteen pounds of the same cloth equally deep; which demonstrates, that cochineal is impregnated with only eight times the quantity of dyeing or colouring particles that madder is; nor is its colour at all so fixed as that of madder; notwithstanding which, the madder sufficient to dye that quantity of cloth, or sixteen pounds, may be purchased for 4*s.*; when the cochineal necessary to dye the same quantity of cloth costs 15*s.* It is evident, then upon the whole, that it is the scarlet of the cochineal which makes it so valuable at market; for, in times of war, it occasionally sells from 30*s.* to 32*s.* per pound, and not altogether its being so replete with dyeing particles. Therefore, as the colour of our substitute com

so close to the scarlet of cochineal, and is at the same time infinitely more fixed, may it not be reasonably presumed, that our substitute will, in the course of a few years hence, lower the value of that high-priced dyeing ware, to the ease of the manufacturers, and profit of the most industrious and ingenious farmers.'—*Board of Agriculture.*

CHAP. VIII.

GRASS.

SECT. I.—MEADOWS AND PASTURES.

1. *NATURAL meadows* are no where to be found, as all grass-land which is in a state of nature, neither enclosed nor cultivated, is universally pasture.

Natural pastures are the most wretched of all grass-land; and, in this county, are only to be met with in commons.

The first uses to which grass-land could possibly be put, were pasturage. Many centuries, or perhaps several thousand years, afterwards, the invention of preserving grass, by drying it into the state of hay, took place; which circumstance gave rise to meadow. The conversion of grass into hay, it is highly probable, was known long before the discovery of tillage: if so, the first meadows

dows must of necessity have consisted wholly of vir earth. To such small tracts of ground, some persons a still disposed to limit the extent of meadow land. F my part, I think all land that is annually mown, ou to be called meadow; ground that is continually fed cattle, seems to me to be pasture; and why should a grass-land which is occasionally either mown or fed, meadow the years in which it is mown, and pasture t years in which it is fed?

2. *Near the River Lea.*—There is some excellent gra land on the Middlesex side of this river, lying in t parishes of Enfield, Edmonton, Tottenham, &c. co taining about 2000 acres: such of it as lies in the parish of Enfield and Edmonton, containing about 1200 acr has been lately enclosed, and that has advanced the re of it from 25*s.* to 4*l.* per acre; the rest of it is divided, land-marks, among a great number of proprietors, pieces containing from a rood to four or five acres ea The common meadows are opened for the reception the cattle of every inhabitant of their respective parish from the 12th of August in every year, until the 5th April in the following year. On the latter day the cat are taken off; and soon afterwards the ground is prepa for a crop of hay, which it yields in July.

This tract of land is occasionally flooded every winte and also once in two or three years, in the summer, water impregnated with manure, brought from the w dressed and chalky lands of Hertfordshire. If these oc sional floods were made to pass off in a few days, or soon as they had deposited their enriching particles on t land, they would promote a very high degree of fertilit but unfortunately, the drainage is so interrupted fro Stratford-le-Bow to the Thames, that *the water is detain*

muc

water too long on the land; and, owing to the very nature of common meadows and pastures, the sewers, ditches, and drains, are so shamefully neglected, that *the soil is chilled, the best grasses destroyed, and a worthless herbage substituted in their place.*

These meadows are said to produce about *a ton of ordinary hay per acre,* and are lett for about 25*s.* on an average. If they were enclosed and embanked, and a proper drainage obtained, they would be as well worth 3*l.* or 4*l.* per acre.

3. *Near the River Thames.*—In many of the parishes on the Middlesex border of this river also, there are meadows and pastures, though of small extent, which are occasionally laid under water by floods in winter; and sometimes, though in a less degree, in summer. Perhaps there may be 100 acres which are sometimes overflowed by particularly high tides. The water drains very readily off much of this land at the reflux of the tide, particularly so much of it as lies adjoining to the river. But some parts of it are situated rather more distant from the Thames, and the surface being nearly level, the water is more interrupted, and consequently runs very slowly off; although these meadows generally have ditches along the *lower* side of them, to assist in draining off such part of the water as remains after the flood and tide have retired.

Wherever the water remains too long, the produce is coarse, poor, and watery, mixed with flags; and when made into hay, in the best manner, it is sandy, and of little value.

4. *On the Borders of the River Coln.*—There are extensive meadows and pastures on the borders of this river,

the whole way from Stains to Harefield. The soil is a black, peaty, tender nature, and but little above the level of the river. Such of them as are enclosed and drained, are very fertile; but much the greater part of them are *Lammas-meads*, and one of the necessary consequences is, that *the ditches* are so much neglected as to be nearly grown up.

The pastures are more than half covered with mole and ant hills; and, in some places, gravel has been dug from them in such quantities as to leave them under water.

The drainage being neglected, the land is consequently filled with water, and thereby rendered *unsound*. No farmer would hire it, if he were obliged to continue it in its present condition, *at any price;* but, if it were enclosed and properly drained, the produce would yield from 5*l.* to 8*l.* per acre.

The whole of the several tracts of grass-land included in the foregoing description, contain about 2500 acres. They are subject to be flooded by sudden and heavy rains even during the spring and summer months; and, when that happens early in the year, the water deposits among the growing grass quantities of sand, mud, slime, sticks and weeds, which afterwards impede the operations of the scythe; and, above all, reduces the hay in value below the price of straw. *When such a flood takes place* after the grass is mown, and before the hay is carried away, *sometimes floats the summer's produce on the surface of the water*. The occupiers of these lands have only the entire produce of them four months in a year; which, together with the risk of suffering such serious losses during that time, keeps down the rent and produce of this soil shamefully below that rank in the scale of productiveness which

which, from its natural fertility, if aided only by a little art, it would be entitled to possess*.

These tracts of land are formed of the rich particles of calcareous and animal matter, collected from a great extent of chalky country, and deposited here by the floods. As most of it is on a subsoil of the gravel of flints, dry and sound, it requires neither uncommon skill, nor great expense, to lay it properly dry in every season. A very low embankment against the river, would be the means of keeping out the floods; and if the present ditches and drains were perfectly cleansed, and were assisted by such sluices as are usual in all cases of embankment, they would completely disembogue all the superfluous water, and leave the land sufficiently dry. By opening the flood-gates at suitable times, the land might be laid under water once or twice during the autumn and spring; which, on being drained off again, would leave a rich deposit of fertilizing matter, and make this whole district perpetually fruitful. It might then yield its great produce towards manuring and enriching the neighbouring land†.

The power requisite for this, could only be derived from the authority of Parliament. To make the improvement complete, the common fields should be enclosed, and every man's land laid together. If this were done, there would be many parcels of land sufficiently large to induce the proprietors to embank their own from the rest;

* In Norfolk, too, the coarse, benty, rushy, reedy trash, which is the natural produce of their marshy grass-lands, is very disgraceful *to the country*, but still more to the *landlords and stewards* of that county.—*J. M.*

† There would also be occasion for a small number of fen-mills, in the whole district, to raise several small streams into the rivers in times of flood.—*J. M.*

by

by which means they might flood it at pleasure. At any rate, much of the district would thus be fitted for the richest kitchen-gardens, fruit-gardens, and nursery-grounds; and all the remainder would make the best meadow in the county; perfectly fit for the production of *two or three* crops of *cow hay* in every year, or of *one* crop of *hay for horses*, and of one more for cows.

5. *The Isle of Dogs*,—lately reduced to 500 acres by the West India docks, lies at the south-east corner of this county, and would be overflowed every tide, were it not secured by an embankment. This ground is divided by ditches, which empty themselves through sluices, at low water, into the Thames, and keep this tract of land sufficiently dry. It is perhaps the richest grass in the county, but if it were the most barren in the kingdom, it might be enriched by the easiest of all possible means, namely, by only opening the sluices, permit the tide to lay the land under water for a few hours, until it deposit the rich matter which is constantly floating in the river so near London, and then draining the water off by the same sluices, into the Thames. This operation repeated a few times, would not fail to make the poorest land become as good and productive as any in the world.

6. *Upland Meadows and Pastures.*—About seven-eighteenths of this county, or 70,000 acres, consist of grass-land of this kind, great part, or nearly the whole of which, exhibit the usual marks of the plough (ridge and furrow), and, owing to the soil being mostly a loamy yellow clay, is very tough and gluey, mixed with the gravel of flints, which is more frequently contained in a kind of bason than equally mixed in any certain proportion. Such being, I apprehend, the original soil, it was

untractable and ill calculated for the plough as the greater part of Enfield-chase is at this time; but, being cleared of trash, and laid down to grass, with the assistance of the town dung, it became, and has long continued to be, meadow of the first quality. This land is still manured in a greater degree than any other meadow (not watered) in this kingdom. Care is also taken to prevent even the least poaching, by removing the heavy cattle on the 10th day of October, or sooner, if rain falls in quantity sufficient to soften the ground, as it is well known, that wherever a bullock makes a hole with his foot in this kind of soil, it holds water, and totally destroys every vestige of herbage, which is not quite replaced till several years after the hole is grown up. The rest of the after-grass is eaten by sheep, which are continued till the 2d day of February, about which time they are sent away*.

Taking the cattle so soon off the meadows, is said to promote early vegetation, which affords a beneficial shade to the soil, and that secures a plentiful hay-harvest. This is sound reasoning when applied to land which is liable to burn by the heat of summer; but on all other soils, I think the sheep might be continued till the end of March, and, in moist seasons, one week into April, without any diminution of the future crop. This is confirmed by Dr. WILKINSON, who says, 'in the neighbourhood of

* 'In Middlesex, the cattle are turned in directly after mowing; in the North, the grass is almost invariably kept till October or November, or even later, when it is come to a good head again, which is called *eddish* (probably from eatage), and is much depended on for finishing fat stock. Some of the fat cheese is likewise made from the eddish, called eddish cheese. I don't pretend to decide which is the better practice. I have observed the eddish in wet weather miserably trod and soiled, so that much, I think, must be wasted.'—*Sir Rich. Sutton.*

London

necessary. I do not apprehend that the blade i
in its growth by being pastured and manured
in its early and succulent state, when, though
is tender, yet vegetation is vigorous and acti
much mistaken, if I have not seen a much mor
and profitable crop from land thus grazed ev
before being shut up, than where the manurin
more ample, the mowing constant, and sheep
early in the season.'

After the hay has been removed from the
some of the farmers of this county study the s
atmosphere, and if appearances indicate approac
they lay on some of the land from which the h
been carried, the dung of neat cattle, and s
manure as happens to be reduced so much as t
being spread with a shovel, and no other. Or
trary, when the barometer does not bespeak,
degree of certainty, a pretty heavy fall of rai
composed manure, as well as all the rest, is a
remain in the dunghills till the end of Sept
which time it is applied, while the soil is suffic
to bear the drawing of loaded carts without in
when the heat of the day is so moderated, as
hale the volatile parts of the dung.

Manuring the same ground every year, exhaus

terms. New meadows are more subject to this defect than such as are old; therefore land recently restored to grass should not be mown, but pastured, as the latter is a certain method of furnishing it with fine herbage. The present state of the grass-land at Mary-le-bonne, Paddington, and Pancras, prove, that manuring old meadows every other year, is sufficient to preserve a thick bottom, notwithstanding they are mown every year. Many of the farmers in Middlesex covenant to mow only once in each year, and to spread on the land a thick coat of stable dung, thoroughly rotten, every third year: this management has been found to support the soil in good heart. There are other farmers who occasionally mow twice in one summer; but such persons always ought to have, and most of them actually have, previously provided rotten dung sufficient to cover the ground soon after the second mowing. The better sort of farmers, who intend their hay should support horses, refrain from mowing the same land more than once a year; as they have learned from experience, that it is better to feed the whole of the after-grass, with the intention of increasing the principal crop of the following year.

This large district of *clay land*, would have been of little or no value *in a state of aration*. The difficulty of tilling it, the expensive teams which must have been employed on it, the few months in every year when it could be ploughed with success; and the *uncertain* produce of such a soil, are circumstances which *would have kept down its value to little or nothing. But mark the difference! laying it down to permanent grass, has been the means of its annually producing, in a medium of seasons, one ton and a half of hay per acre, of the highest quality, for the feed of horses, in the world; and of enabling the farmers to pay a much higher rent*

for

for it than they can afford to do for the best land in a state of cultivation.

Meadow land in the occupation of *cow-keepers*, is generally mown two or three times in a summer. Their great number of cows enable them to dress it every other year, *and they are studious to procure their hay of a soft grassy quality*, not letting it stand till the seedling stems rise, but mowing it three or four weeks sooner than it would be advisable to do for the support of horses. This land lies near the town, as at Islington, Mary-le-bone, Paddington, &c. and is usually mown the first time in each summer early in May*.

Towards the latter end of March, the surface of the meadows of this county usually become sufficiently dry to bear the treading of labouring horses without injury; then they are bush-harrowed and rolled, which impresses them with a smooth surface, and that is favourable to good mowing.

There is very little enclosed land in this county pastured, except commons; part of gentlemen's parks; and here and there two or three acres, for the run of a cow or two to supply milk and butter for the use of the families that keep them.

---

* For rich grazing land, the management, produce, expense and profit, see the Somerset quarto Report, pages 103 and 104.

An Estimate of the Produce, Expense, and Profit, of Meadow Land adjoining London.

THE PRODUCE.

				£.	s.	d.
The very best upland meadow, in the highest state of manurage, cannot produce, on an average of seasons, more than two loads of hay. A first crop of grass has been known to be as heavy as three loads per acre; and no land whatever is capable of yielding more. Every farm of considerable extent, comprises land of various degrees of productiveness; therefore, I shall suppose an average crop of the whole district to be one load and three-fourths of a load per acre; which quantity of hay, at the average price of 5*l.* is per acre, - - - - - - - -				8	15	0
The second mowing occasionally produces one load of hay per acre, but I think it does not average more than three-fourths of a load, which usually sells at 1*l.* per load under the price of the first. When the first made hay, of medium quality, can be sold for 5*l.* the second is worth 4*l.*; therefore three-fourths of a load of the latter will produce				3	0	0
Deduct mowing, making the hay, and the stack, straw, and thatching, per acre, - - -	1	0	0			
Binding, carriage, and marketing, - -	0	7	0			
Cost of dung, cartage, turning it, re-loading, carriage, and spreading it on the land, -	0	7	0			
Together, - - - - -				1	14	0
Which, taken from the sale price of the hay, leaves -				1	6	0
To which add for winter feed, - - - - - -				0	7	0
And it will shew, that the rouen, or second crop, when made into hay, and the land afterwards fed through the winter, produces, per acre, the net sum of - -				1	13	0
When the farmer mows only once a year, the rouen is usually fed by cows till October: this is supposed to be worth what it frequently may be sold for, namely, -	1	0	0			
The land is fed by sheep from October till March: this is generally sold at -	0	5	0			
The whole of the after-grass, when fed by cattle on the land, produces per acre, - - - - - - - -				1	5	0

The difference between converting the after-crop into hay, or making pasturage of it, is thus shewn to be on 8*s.* per acre. The risk of making second-cut grass into hay, is considerably greater than the first: the days are shorter, the dew lies longer on the ground, it is more soft and difficult to cure, and in a wet season it is sometimes lost, or so ill got, as to be of small value. When the superiority of the manure left on the land by feeding is taken into the estimate, it decides the comparison in favour of the grazing system. Therefore I shall, in this estimate, state the pasturage of mown ground at per acre 1*l.* 5*s.*; which sum, added to the sale price of the first hay, 8*l.* 15*s.* proves that the meadow land near London averages per acre, per annum, 10*l.*: the extremes vary from 8*l.* to 12*l.*

EXPENSE.

	£.	s.	d.	£.	s.	d.
Bush-harrowing and rolling per acre, - -	0	1	6			
Fences, drains, gateways, stiles, killing moles and ants, - - - - - - - -	0	3	0			
Petit expenses of other kinds, - - - -	0	0	6			
Together, - - - - -				0	5	0
Mowing and beer, - - - - - -	0	5	6			
Hay-making, loading, making the stack, and beer,	0	12	0			
Horses, harness, and carriages, - - - -	0	2	6			
Straw 4*s.* 3*d.* thatcher and labourer 9*d.* together	0	5	0			
				1	5	0

These articles vary from 20*s.* to 30*s.* according to the bulk of the crop, and the weather: seven years ago they averaged 20*s.*; at this time they cost the farmer 25*s.* If the hay should be put into a barn, the last charge of 5*s.* will not be incurred, and part of the 12*s.* will be saved: in this case, the whole expense will not exceed 19*s.*; therefore the difference in favour of hay-barns is 6*s.* per acre.

Carried over, - - - - - - £.1 10 0

Brought

	£. s. d.	£. s. d.
Brought over, - -		1 10 9
; binding, and loading the hay in ;s, per load, - - - -	0 2 0	
e, if the distance be within two or three of the place where the hay is to be de- :d, two loads per day, performed by man and two horses, 11*s.* 6*d.*; toll- 1*s.* beer 6*d.* : in this manner the two cost 13*s.*; therefore one load would - - - - - - - -	0 6 6	
n, market expenses, stand carts, and f the market, per load, - -	0 3 0	
; and marketing the hay costs per load,	0 11 6	
, on an average crop, is per acre, - - -		1 0 0
hole of the foregoing expenses amount, per acre, to		2 10 0
e once in three years is supposed to cost the farmer five :as per acre, or annually, - - - -		1 15 0
assessments, and tithes, - - - - -		1 0 0
charge, exclusive of rent, averages about - -		£.5 5 0

m the foregoing statement, the annual expense per according to the bulk of the crop, may be deduced ows: namely,

ien the crop is only one load per acre, the expense vill be,

	£. s. d.	*Expenses per Acre.* £. s. d.		*Manure, Taxes, and Tithes, per Acre.* £. s. d.		*Every Expense, except Rent, per Acre.* £. s. d.
expenses,	0 5 0					
king,	1 3 0					
ing,	0 11 6	1 19 6	and	2 15 0	is	4 14 6
per acre,	0 5 0					
	1 3 0					
	0 14 4	2 2 4	and	2 15 0	is	4 17 4
per acre,	0 5 0					
	1 4 0					
	0 17 3	2 6 3	and	2 15 0	is	5 1 3
		U 2				1¾ load

	£.	s.	d.	Expenses per Acre,				Manure, Taxes, and Tithes, per Acre.				Every E except per A
1¾ load per acre,	0	5	0									
	1	5	0									
	1	0	0	£	s.	d.		£.	s.	d.		£.
				2	10	0	and	2	15	0	is	5
2 loads per acre,	0	5	0									
	1	6	0									
	1	3	0									
				2	14	0	and	2	15	0	is	5
2¼ loads per acre,	0	5	0									
	1	7	0									
	1	6	0									
				2	18	0	and	2	15	0	is	5

Deduct every expense of an average crop, five guineas, the sale price of the produce, 10*l.* and there remains 4*l.* 15*s.* to be divided into interest of stock, rent, and r neration. It is therefore clear, that the farmers of g land adjoining London, cannot afford to pay the re it by growing hay for sale; but the occupiers of i mostly cow-keepers, keepers of livery stables, salesmen, and butchers; the profits of whose bu enable them to pay a rent considerably higher.

Estimate of the Produce, Expense, and Profit, of 150 of good Grass-Land, Eight Miles distant from St. J Haymarket.

	£.	s.	d.
The hedge-rows, scite of buildings, yards, ways, and waste, of such a farm, are usually about 15 acres, which leaves 135 of mowing ground. Good upland meadow, at such a distance from the dunghills, yields at one cutting annually, on an average, one market load and a half of hay per acre. Well made hay has been sold, during the last ten years, to average 5*l.* per load, which is equivalent, per acre, to - - - - - -	7	10	0
The pasturage about - - - - -	1	0	0
The whole annual produce, per acre, is -	£.8	10	0

	£.	s.	d.	£.	s.	d.
Which, on 135 acres, amounts to - -				1147	10	0
From which sum deduct the expense of a four-horse team, agreeably to an estimate made under the Section, Expense and Profit,	300	0	0			
Two men all the year, exclusive of the carter, one at 15s. and the other at 12s. or together, at 27s. per week, - - - - -	70	0	0			
The extra labour of mowing and making hay, stacking it, straw, thatching, and beer, at 18s. per acre, - - - - - - - -	121	10	0			
Taxes, assessments, and tithes, about 14s. per acre; on the whole farm, - - -	105	0	0			
Marketing 170 loads of hay, at 4s.; the remaining 32½ being consumed by the team, &c. on the farm, is not attended with this charge,	34	0	0			
Paid for 240 loads of manure, at 2s. 6d. -	30	0	0			
Tenants' repairs of buildings, - - -	10	0	0			
Insurance of stock, and tax thereon, - -	4	0	0			
Pilfering servants, supposed - - -	10	0	0			
Frauds of hay salesmen, supposed - -	10	0	0			
Mole-catcher a guinea, but say - - -	1	0	0			
Et ceteras will always exceed - - -	2	0	0			
The expenses amount to - - - - - - -				697	10	0
Remains for interest of capital, the farmer's superintendance, and rent, 3l. per acre, or - -				£.450	0	0

SECT. II.—SOWN GRASSES.

I. RED CLOVER,

Is grown on the enclosed arable land of this county, in regular succession with corn; and would most likely be so over the whole, if the common fields were enclosed: but the barbarous tenure of such land prevents the culture of this and other valuable plants, and cramps most of the

operations of good husbandry. The instances are very rare indeed, of meeting with a piece of clover in common fields; though, round Shepperton, there are sometimes a few acres which are preserved, by spreading long litter over the young plants soon after the corn is off, or at least before the fields are common for sheep, and which is done to keep them from feeding it too close, or pulling it up by the roots.

1. *Preparation.*—This plant has the uncommon merit of not requiring any extra preparation of the soil, nor any expense above the price of the seed.

2. *Seed—(quantity).*—Twelve or fifteen pounds per acre is the quantity usually sown; though it ought to vary with the nature of the land. In rich land, every seed vegetates, and comes to maturity. On land that is rather poor, a portion, perhaps a quarter of the seed, dies after vegetating. On land that is much exhausted, or naturally very poor, a great many of the young plants die, and much of the seed does not even vegetate at all. In order to make up for such great failure in the success of the plants, the quantity of seed should be increased in proportion to the poverty of the soil, and decreased in proportion to the richness of it, and also with regard to the suitableness of the crop to the nature of the land. Twelve pounds sown with barley, on a loamy sand, clean, and in good heart, is sufficient; and sixteen or eighteen pounds will not be too much with wheat, in a stiff loam on a clay bottom. The London markets require that it should not be mixed with ray-grass, or any other grass, as such mixture reduces the price of clover hay considerably.

3. *Steep.*—Not any used, though it would unquestion-

ably force the seed into a more general and quick vegetation; and some crops of clover are lost from the want of it.

4. *Time of Sowing.*—Among spring corn, it is mostly sown so as to allow the short-tined harrows that are covering in the corn, to go once, or at most only twice, in a place, after the clover is sown, in order to give it a thin covering; as the seed, being small, round, and heavy, may easily be buried at too great a depth.

Among wheat, some thoughtless farmers in every county, sow clover-seed, and leave it to grow or not, and a bad chance it has. Others sow the seed, and roll it down: this is a bad practice, though on a sandy soil it may frequently succeed; but on clayey land, it can only prosper in wet summers. A good general rule is, to sow clover-seed on wheat, as soon after the middle of March as the land may happen to become sufficiently dry to bear harrowing.

In every case after the seed is sown, the land should be slightly harrowed and rolled.

5. *Cultivation while growing.*—If the land be in good heart, none is necessary; though the plants, while they are in seedling-leaf, should be attended to every day, for the purpose of observing whether they are attacked by slugs, which are too frequently as fatal and destructive to clover, while in this tender state, as they are to turnips; and the same means of prevention should be adopted*.

If it is grown on common-field land, it should, as soon as the corn is off, be covered with long litter from the

* I once lost eleven acres of young clover, in three or four nights, by slugs.—*J. M.*

stable, but not hot, in order to preserve it from the bite of sheep.

In all cases where the soil is not in good heart, as much of it as possible should be manured in the autumn, while the land is so dry as to bear the drawing of loaded carts over it without injury. Whoever dresses his clover with dung fully rotten in autumn, will find that it will not die away in winter, as it often does under a more parsimonious, but less politic management. Such other parts of this crop as the manure may be insufficient to cover, should have top-dressings sown or showered over it early in the following spring. But where worms and grubs prevail, they usually destroy the clover, though mostly in patches.

Mr. JENKENS spread long litter, hot and smoaking from the stable dunghill, on his young clover, soon after the corn was off, which thinned the plants, by killing some of them; but the rest grew the stronger, and produced an extraordinary great crop. He is still an advocate for manuring young clover in autumn, but with dung previously well rotted.

The loss of some of the plants seems to have been owing to the dung being hot and putrid, and not being well and equally spread. It is the common practice in my neighbourhood to manure the clovers in autumn; and its good effects are so evident as to render the utility of the practice incontrovertible.

6. *Harvesting.*—Every where near London, it is mown when the greatest number of heads are in blossom; but rather sooner than later, as the error of mowing the first crop too early, would be fully compensated by the increase of the second. The proper time for mowing it, may be known by observing the bottom of the plants; and

: should be taken to mow it when the lowest leaves
shew symptoms of decay, by dropping off; for
op is suffered to stand longer, the consequence
that it will lose more at bottom than it would
op. This takes place near, or soon after, the
of June.

it is mown, the swaths should not be spread, as
actice with meadow hay, but suffered to lie as the
aves them, until they are dried about two-thirds
, which, if the weather proves favourable, will
out three days. If the weather should then look
g, the swaths may be turned with rakes imme-
after the dew is off; and, if no rain falls, it will be
ck the next morning (the fourth day) as soon as
is gone; and may be carried in directly.

the clover is cocked as soon as the dew is off,
es will be just sufficiently tough to preserve
but if this operation be omitted in the morning,
formed in the heat of the day, the leaves will have
so much too dry, as to be reduced to dust, and
he business of heaping and loading. If, however,
ped in good time, the loading and stacking may
l the day. When part of it is become rather too
ere is an art in putting the rows into heaps, to
ubbing the leaves off. This is only familiar to
the best work-people, and is rather difficult to
; but it is done by very lightly rolling the swaths
h rather larger forks than usual, keeping it whole
ther, laying it lightly into the cock, and being
to avoid breaking and tossing it about, shoving it
ground, or beating it down.

cattle should be kept out of the field; and, in that
e second crop will be in full blossom, and ready
scythe, so as to be mown the first week in September.

tember. This crop must be harvested as the first, should not be longer delayed, both on account of losing in weight, as aforesaid, and of getting it into st before the equinoctial rains set in. After this, there be a little sheep-feed previous to ploughing the land u

Mr. LEMON, of Loddon (Norfolk), in 1793, fe thick plant of clover down by his stock of cows, sh and horses, during the month of May. He then le grow for a crop of seed, and it produced him four shels per acre, which he sold at 36*s*. per bushel, or 7*l*. per acre. The seed was of the best quality, and in 1 would have produced five guineas a bushel. His fa once had eight bushels per acre. Clover-seed has la sold at 7*l*. 10*s*. per bushel.

7. *Produce.*—A showery summer produces great cr and every dry one stunts them to one-half. The nat quality of the soil has a considerable effect, and its be in a high or low state of cultivation, has still more; l on the general average of years and soils in this cou the two cuttings produce three loads of marketable h which, for the last ten years, may have yielded from teen to twenty pounds per acre.

8. *How disposed of.*—Most of it is sold and delivere London for the support of draught-horses. It is the neral opinion, that it is more nourishing than any ot hay, except sainfoin; and it sells at about 15*s*. a higher than meadow-hay.

Clover is the most profitable plant grown on any farm; in every case, when it is destroyed by vermin, such the fly, slugs, or worms, the corn-stubble should ploughed down soon after the corn is reaped, and land sown with tares.

This plant grows a full crop in all the arable lands of this country, from the sands of Norfolk to the clays of Cleveland and Sussex. Various soils that have been exhausted by corn, and not much accustomed to clover, have been so much restored by it, as to produce a good crop of wheat; but to do this, every means should be used to secure a full crop, as that is an excellent preparation for corn, and seldom fails of ensuring a considerable produce, arising from shade, smother, and putrefaction, the natural and constant attendants of full-grown clover. In some poor cases, it may be advisable to permit both the first and second crops of clover to be eaten green on the land, by sheep and bullocks; being mown, and given them to feed, in the same manner as I have recommended to be done with tares. It sometimes may be advisable to make hay of the first crop, and soil the second, or *vice versa*.

'Clover is sometimes employed in fattening sheep, from the beginning of April till the end of May (by which time, or sooner, they may be sold to the butcher), then kept uneaten till July, and mown for hay: in about two or three weeks after the said hay is off, sheep intended to be fattened with turnips, should be turned in, and kept there till they go to turnips. With the exception of uncommon rich marshes, there is no pasture that will support so much stock as clover and ray-grass.'—*Messrs. Culley.*

An Estimate of the Produce, Expense, and Profit, of a Crop of Clover, grown Eight or Ten Miles from London.

THE PRODUCE.

	£.	s.	
Clover-hay has sold in the London markets, during the last ten years, at various prices, which would average 5*l.* 15*s.* per load: if we suppose the medium produce to be three loads, they are equivalent, per acre, to - - - - -	17	5	0
After the second crop is off the land, there is usually a little sheep-feed, worth, per acre, about - - - - - -	0	5	0
The entire produce of one acre of clover, - - - - -	£.17	10	0

The extremes are from twelve to twenty guineas.

THE EXPENSE.

				£.	s.	d.
Seed, and sowing it, per acre, - - - - - -				0	12	0
Fences, gates, ways, and stiles, - - - - - -				0	2	0
Mowing two cuttings, and beer, - -	£.0	11	0			
Making, loading, and stacking the two, -	0	15	0			
Horses, harness, and carriages, - - -	0	5	0			
Straw, 8*s.* thatcher and labourer, 1*s.* 6*d.* is -	0	9	0	2	0	0
Cutting, binding, and loading the hay in trusses, three loads, at 2*s.* is - - -	0	6	0			
Carriage from any distance where the team can go daily; two horses and a man one day, 11*s.* 6*d.*; toll-gates, 1*s.*; beer, salesman's charges, and room for an empty cart at market, 2*s.* is, per load, 14*s.* 6*d.* or, per acre,	2	3	6			
Binding and marketing the hay, costs, per load, 16*s.* 6*d.* or, per acre, - - - - - - - - - -				2	9	6
To return a load of manure, two additional horses are used; they cost 8*s.* 6*d.* and the dung 2*s.* 6*d.*; together, 11*s.* per load; or, per acre, - - - - - - - -	1	13	0			
By the time the last article is spread on the land, it costs an additional 1*s.* 6*d.* a load, or, per acre, - - - - - - -	0	4	6			
Three loads of manure, at 12*s.* 6*d.* is - - - -				1	17	6
Carry over, - - - - - - - -				£.7	1	0

Three

Brought over, - - - - - - -	£.7	1	0

: last four articles shew, that converting hay nto manure, and spreading it on the land, costs l. 9s. per load.

t expenses of various kinds, - - - - - -	0	2	0
pose rent, tithe, taxes, and assessments, to amount, per re, to - - - - - - - - - - -	2	17	0
: whole of the foregoing charges amount, per acre, to	£.10	0	0
ich taken from the produce of 17l. 10s. leaves a profit, per ere, of - - - - - - - - - - -	7	10	0

The two cuttings of clover with superior farmers, or on an land in good heart, yield four loads per acre; in all ch cases, the profit is increased to 11l. 10s.

The utility of salting clover-hay, will be mentioned reafter.

II. SAINFOIN,

Is not grown in any part of this county; but the su-rior value of its hay is well known in the London arkets: *it produces at least a guinea a ton more than meadow y equally well cured.* It is brought from the chalk-hills Surrey and Kent, and cannot be too much recom-nded to the owners and occupiers of all the limestone d chalk soils in the kingdom.

This is a valuable plant, and requires a dry and strongly-careous soil: such as have a subsoil of chalk, of lime-ne, or perhaps of shell-marl, are the most suitable for cultivation. I do not know of any land in Middlesex at is particularly proper for it.

With all the improvers of chalky downs and limestone soils, is should be the principal plant. Tares, turnips, clover, should

should all be fed green, and in the field, to prepare the [illegible] *with rich substances for being laid down with sainfoin.* [illegible] would amply repay to the end of a twenty-one years' lease, by an annual produce of two tons of hay per acre, of the highest quality for the feeding of cattle, and raising mountains of the richest dung. What an occupier should always remember is, that rich land makes wealthy farmers.

"Sow six bushels of seed per acre with the spring corn (taking care that the seed was of the last year's growth, as no other will vegetate): in about fifteen or sixteen months just top it, to keep down weeds, as it does not blossom until a year later; at all events, it never must be eaten down by any kind of cattle after Christmas, which would destroy the bud for the next year. Top-dressings are very suitable."

III. RESTORING ARABLE LAND TO GRASS.

The most usual method in this county, is to manure plentifully, and to cleanse the soil thoroughly with hoeing crops, one or two years previous to sowing hay-seeds with barley or oats. In cases where the soil is so rich that there might be some risk in sowing a full crop of corn, by which the grass would be smothered, less corn is sown, even so low as one-third of the usual quantity of seed, in order that it may serve the double purpose of a nurse to rear up the young plants, and a shade against the rays of too hot a sun. When the corn is carried off, the young crop of grass is but little fed during autumn; but it is heavily rolled in the following spring, in order to press the soil home to the roots; and it is then treated as permanent pasture.

The

e foregoing method is unexceptionable, as to all that has been well supplied with manure. Where it own that the land is not so highly conditioned, the tion would be equally successful by cleansing the d well after its having produced in succession, winter turnips, and winter tares, all fed on; then laying on re, ploughing it in with a very thin furrow, and in st, or early in September, sowing grass-seeds with-orn. The produce would be a most abundant crop ext summer; and it ought not, on any account, to own, but from the following April treated as pasture. ave changed much land from arable to grass, by both methods, with equal success, except in a single in-, which convinced me that white clover will not a severe winter, when sown late in September.

third method of converting arable land into per-nt grass is, to give it a summer-fallow, and, in se of a continuance of wet weather through the sum-which may prevent a clayey soil being thoroughly ed from root weeds in one season, fallow it the next and the next, rather than sow grass-seeds before perfectly cleansed. It should be plentifully dressed such manure as is thoroughly reduced, and the seeds eds, as well as the eggs of insects, destroyed by heat ntrefaction. Lime may be added, where the soil is sed to want it, and can be procured at a moderate se. The soil being so cleansed and enriched, may wn with grass-seeds as it becomes ready in August eptember. This method is inferior to either of the s, as it has not the advantage of green crops fed by on the land, to supply it with animal manure.

fourth, and occasionally promising method, is de-d in the Survey of Nottinghamshire, which is, to in March or April, half a peck of rape instead of corn,

corn, with the grass-seeds; the rape will get sufficiently high to shade the young grass from the sun; and in the second week of July, ten or twelve wethers, or ewe sheep, per acre, may be turned in, which will become fat enough for the butcher by the end of September.

Any poor couchy pasture may be cleansed and restored to grass of a tolerable rich quality, with only submitting to the loss of its miserable produce for one year. To do this, pare and burn the turf, spread the ashes, and then plough the land thin and clean; harrow and re-plough an inch or two deeper, then harrow the soil to pieces, and sow grass-seeds early in August.

Land of a drying nature should be laid down with a flat surface, and clayey soils should receive the grass-seeds in a state of ridge and furrow. A ridge of twelve feet wide takes a proper shape on one ploughing from the level, for ordinary occasions; but when the intention is to convert the soil into meadow for floating, the ridges should be ten or twelve yards in width.

To procure proper seeds for the purpose, is a very difficult part of this business. Large quantities are sold at tenpence per bushel, at the Royal Mews, Charing-cross; where the *best hay* is consumed, consequently it is supposed to be the most likely place to procure the *best seeds*; and certainly, upon examination, they look particularly bright and well; but this appearance is principally owing to the greater part consisting of blossoms, instead of seeds; the reason of which must be, that the hay was made while the grass was in blossom, before the bulk of the seeds were perfected; so that, probably among twenty bushels of these pretended seeds, there is not really contained more than two pecks in a good and perfect state. Meadow fox-tail is of great value, and its seeds may be collected with ease, and in plenty, from the swaths, during mowing time,

ıe, by children. But for a general assemblage of mea-
w grasses, the best way is to *save for seed* a piece of fine
l meadow, that is known to abound with the best sort
grasses, by letting it stand about three or four weeks
ıger than usual, or until it be ripe. Then mow the
ass, and thrash it, without suffering it to heat in the
ck; and during the autumn of the same year, sow the
ıd you intend to lay down with the seeds thus procured.
) which add for every acre, one bushel of Peacey's ray-
ass, 20lb. of white clover, 3lb. of yellow clover, 3lb.
red honeysuckle, 3 lb. of timothy, 1 lb. of ribwort,
d 2 or 3 lb. of burnet; together with meadow soft-
ass, meadow fox-tail, cocksfoot-grass (and, in some
ses, sainfoin), or any other meadow grasses that may
obtainable.

It is not expected that every person who means to
ange a small quantity of arable land to grass, should be
the trouble of thrashing hay for the seeds, nor will he
able to procure more than half the seeds mentioned
the preceding paragraph; indeed it is not very material,
r a good pasture may be obtained by sowing only a
shel of perennial ray-grass, and 20 or 30 lb. of white
ver, to which may be added such other grass-seeds as
e easily procurable.

Mr. MAXWELL is right, who advises that grass-seeds
ould be purchased by the landlord, and sown under his
n eye, or at least by some person in whom he can con-
e; for generally, tenants had rather these seeds should
grow, it being their desire to continue the land in
ıge.

n case the land should become too light or puffy, a
vy roller should be drawn over it. In every case it
t be kept free from live stock during the first autumn,
ter, and spring, till the following April, when it may

be stocked principally with sheep, to which may be added one head of neat cattle to every two or three acres.

If there should be any appearance of the herbage falling off about the third year, it should be dressed with finely reduced manure, and if needful that should be repeated about the fifth year.

Farms on the western coast should, after being well drained, be laid pretty generally down with grass-seeds. The humidity of the climate in that district of the island, is certainly unfavourable to the general ripening and harvesting corn; though the drier lands in this situation are excellent for root crops. Grass should undoubtedly be the staple; roots might be grown to clean and renovate the land, and one crop of corn to lay down with. This would keep all the west in a constant high state of fertility.

A celebrated Author justly observes, "it is the subterfuge of ignorance or knaves, to say that grasses do not thrive in their lands; but the true reason is, they do not lay the lands in proper condition, nor with proper grasses and good seeds; for certain it is, that where corn grows, there grasses may grow also; and that they are, when properly managed, very profitable to the farmer, let his land be whatever it will, as they keep the land constantly in good heart, and so afford the most constant and rich produce to the cultivator."

I am sorry to say, it is the practice of *some* farmers, in most other counties, though not so in Middlesex, to continue sowing corn so long as the land will produce any, and then to apply to the landlord or his steward, saying they are ready to lay such a field (thus shamefully exhausted!) down to grass, provided he will give them permission to plough up an equal quantity of old grass land. In this application they too often succeed; and thus they go on ruining one field after another.

MINUTES

MINUTES ON CONVERTING GRASS LAND INTO TILLAGE, AND RESTORING IT INTO PASTURE.

Romney-Marsh, Pevensey-Level, other salt marshes, and all grass-land which is rich and capable of fattening neat cattle and sheep, or that can depasture from three to five or six sheep per acre through the summer, ought not on any account to be ploughed. Neither ought grass-land that is capable of wintering two ewes, and in the following summer fattening them and their lambs, be brought into aration. Land that is capable of being artificially watered, whatever be its quality, is too valuable to be ploughed. Any clean turf with an herbage mostly of white clover, will be relished by sheep, and ought not to be ploughed. If the herbage is less abundant than could be wished, manure it, or graze it entirely with sheep, and give them ground oil-cakes, but avoid breaking up the surface. Meadows by the side of rivers, consisting of virgin earth, producing valuable herbage, no agriculturist would ever suffer to be in any other state.

There are cases in which fern, rushes, thistles, or perhaps moss, so much abound, as to make it advisable to plough them up. Any land that has become much infested with furze, heath, or other shrubs, and all grass-land that is very unproductive, may be corrected by a judicious application of the plough.

In every case of much rubbish, begin by paring and burning, and sow with rape in April, May, or early in June, when you wish to feed it off in August and September; or sow in July for spring-feed; or it may be sown in August and September for later feed or seed.

A poor clay pasture may be pared and burned, and sown with rape in May, which may be fed off in Septem-

ber. The same land may be ploughed in October, and effectually tilled the following spring, and again sown with rape in May; and this course may be repeated annually, until the soil acquire any desired degree of richness.

Or a cleaner course would be, winter tares sown in September, and fed off in May and June the following year; which would give time to cleanse the soil in July and August, to re-sow tares in September; and this might be repeated annually, till the land acquired a high degree of richness.

Or, after cole has been fed off in September, plough the land, and sow winter tares; feed them off the following May and June; then plough, and sow cole, in July, to be fed off the following spring; then prepare the soil, and sow corn for a quarter of a crop with a full crop of grass-seeds.

As for free loam, including such soils as are suitable for turnips and barley, pare and burn the turf, sow winter tares, feed them off; then sow turnips, feed them on the land; then corn, mostly wheat, to be sown in the spring: thus having two green crops and one corn crop in two years. Immediately after corn harvest, plough, and sow winter tares, to be fed off; let them be succeeded by turnips, and then corn; and continue this rotation so long as the land remains in aration; and when it may be thought advisable to restore it to pasture, it will only be necessary to sow a full crop of grass-seeds among the corn, which, in that case, should only have a bushel, or a bushel and a half of seed-corn, per acre.

By grass-seeds I only mean white clover, 30 pounds; ribwort, two or three pounds; and perennial ray-grass, one bushel. These are capable of making a good pasture; but red honeysuckle, nonsuch, timothy, and burnet,

when they can be obtained, may be added, three pounds of each; and, if the land be moist, add meadow-foxtail, cocksfoot-grass, and the smooth-stalked meadow-grass.

SECT. III.—HAY-MAKING.

THIS branch of the rural art has, by the farmers of Middlesex, been brought to a degree of perfection altogether unequalled by any other part of the kingdom. The neat husbandry, and superior skill and management, that are so much, and justly, admired in the *arable* farmers of the best cultivated districts, may, with equal justice and propriety, be said to belong, in a very eminent degree, to the *hay* farmers of Middlesex; for by them, may very fairly be claimed the merit of having reduced the art of making good hay to a regular system; which, after having stood the test of long practice and experience, is found to be attended with the most desirable success. Even in the most unfavourable weather, the hay made according to the Middlesex manner, is superior to that made by any other method, under similar circumstances. It is to be regretted, that this very excellent practice has not yet, except in a very few instances, travelled beyond the borders of the county. But as it most justly deserves the attention and imitation of farmers in other districts, I shall, for their information, endeavour minutely to describe the method in which the Middlesex farmers make their hay.

IN order that the subject may be more clearly understood, I shall relate the particular operations of each day, during the whole process, from the moment in which the mower first applies his scythe, to that in which the hay is secured either in the barn or in the stack. Before I enter

more immediately on this task, I would just premise a few observations, viz. when the grass is nearly fit for mowing the Middlesex farmer endeavours to select the best mowers, in number proportioned to the quantity of his grass, and the length of time it would be advisable to have it in hand; which having done, he letts it out, as piece-work, or to be mown by the acre*.

About the same time he provides five hay-makers (men and women†) to each mower. These last are paid by the day, the men attending from six till six; but the women only from eight till six. For an extra hour or so in the evening, when the business requires dispatch, they receive a proportionate allowance.

The mowers usually begin their work at three, four, or five o'clock in the morning, and continue to labour till seven or eight at night; resting an hour or two in the middle of the day.

Every hay-maker is expected to come provided with a fork and a rake of his own; nevertheless, when the grass is ready, and labourers scarce, the farmer is frequently obliged to provide both; but for the most part only the rake.

Every part of the operation is carried on with forks, except clearing the ground, which is done with rakes; and loading the carts, which is done by hand.

Having premised so much, I now come to the description of the business of the

First Day.—All the grass mown *before* nine o'clock in

* Each man mows from one acre and a half to an acre and three quarters per day; some there are, who do two acres per day, during the whole season.—*J. M.*

† Including loaders, pitchers, stackers, and all others.—*J. M.*

the

the morning, is tedded, in which great care is taken to shake it out of every lump, and to strew it evenly over all the ground*. Soon afterwards it is turned, with the same degree of care and attention; and if, from the number of hands, they are able to turn the whole again, they do so, or at least as much of it as they can, till twelve or one o'clock, at which time they dine. The first thing to be done after dinner, is to rake it into what are called *single* windrows†; and the last operation of this day is to put it into grass-cocks.

Second Day.—The business of this day commences with tedding all the grass that was mown the first day *after* nine o'clock, and all that was mown this day *before* nine o'clock. Next, the grass-cocks are to be well shaken out into staddles (or separate plats) of five or six yards diameter. If the crop should be so thin and light as to leave the spaces between these staddles rather large, such spaces must be immediately raked clean, and the rakings mixed

* 'The following observations on the Middlesex method of hay-making, were obligingly communicated by THOMAS SKIP DYOT BUCKNALL, Esq. M.P.

'By this regular method of tedding grass for hay, the hay will be of a more valuable quality, heats more equally in the stack, consequently not so liable to damage, or fire: will be of greater quantity, when cut into trusses, and sell at a better price; for when the grass is suffered to lay a day or two before it is tedded out of the swath, the upper surface is so dried by the sun and winds, and the interior part is not dried, but withered, so that the herbs lose much, both as to quality and quantity, which are very material circumstances, at the price hay now fetches at market. An instance in point: the physic gardeners who attend to their business, are very careful, in the proper and equally drying their herbs, and they find their account in it.'

† That is, they all rake in such a manner, as that each person makes a row, which rows are three or four feet apart.—*J. M.*

with the other hay, in order to its all drying of an uniform colour. The next business is to turn the staddles, and after that to turn the grass that was tedded in the first part of the morning, once or twice, in the manner described for the first day. This should all be done before twelve or one o'clock, so that the whole may lie to dry while the work-people are at dinner. After dinner, the first thing to be done is, to rake the staddles into *double* windrows*; next, to rake the grass into *single* windrows; then the double windrows are put into bastard-cocks; and lastly, the single windrows are put into grass-cocks. This completes the work of the second day.

Third Day.—The grass mown and not spread on the second day, and also that mown in the early part of this day, is first to be tedded in the morning; and then the grass-cocks are to be spread into staddles, as before, and the bastard-cocks into staddles of less extent. These lesser staddles, though last spread, are first turned, then those which were in grass-cocks; and next the grass is turned once or twice before twelve or one o'clock, when the people go to dinner as usual. If the weather has proved sunny and fine, the hay which was last night in bastard-cocks, will this afternoon be in a proper state to be carried†; but if the weather should, on the contrary, have been cool and cloudy, no part of it probably will be fit to carry. In that case, the first thing set about after dinner, is to rake that which was in grass-cocks last night into

* In doing which, every two persons rake the hay in opposite directions, or towards each other, and by that means form a row between them of double the size of a single windrow. Each of these double windrows are about six or eight feet distant from each other.—*J. M.*

† It seldom happens in dry weather, but that it may be carried on the third day.—*J. M.*

double windrows; then the grass which was this morning spread from the swaths, into single windrows. After this, the hay which was last night in bastard-cocks, is made up into full-sized cocks, and care taken to rake the hay up clean, and also to put the rakings upon the top of each cock. Next, the double windrows are put into bastard-cocks, and the single windrows into grass-cocks, as on the preceding days.

Fourth Day.—On this day the great cocks, just mentioned, are usually carried before dinner. The other operations of the day are such, and in the same order, as before described, and are continued daily, until the hay harvest is completed.

In the course of hay-making, the grass should, as much as possible, be protected both day and night, against rain and dew, by cocking. Care should also be taken to proportion the number of hay-makers to that of the mowers, so that there may not be more grass in hand at any one time, than can be managed according to the foregoing process. This proportion is about twenty hay-makers (of which number twelve may be women) to four mowers: the latter are sometimes taken half a day to assist the former. But in hot, windy, or very drying weather, a greater proportion of hay-makers will be required, than when the weather is cloudy and cool.

It is particularly necessary to guard against spreading more hay than the number of hands can get into cock the same day, or before rain. In showery and uncertain weather, the grass may sometimes be suffered to lie three, four, or even five days, in swath. But before it has lain long enough for the under side of the swath to become yellow (which, if suffered to lie long, would be the case), particular care should be taken to turn the swaths with the heads

heads of the rakes. In this state it will cure so much in about two days, as only to require being tedded a few hours, when the weather is fine, previous to its being put together and carried. In this manner, hay may be made and put into the stack at a small expense, and of a moderately good colour; but the tops and bottoms of the grass are insufficiently separated by it.

There are no hay-stacks more neatly formed, nor better secured, than those of Middlesex. At every vacant time, while the stack is carrying up, the men are employed in pulling it, with their hands, into a proper shape; and, about a week after it is finished, the whole roof is properly thatched, and then secured from receiving any damage from the wind, by means of a straw rope, extended along the eaves, up the ends, and on each side of the ridge. The ends of the thatch are afterwards cut evenly below the eaves of the stack, just of sufficient length for the rain-water to drip quite clear of the hay. When the stack happens to be placed in a situation which may be suspected of being too damp in the winter, a trench, of about six or eight inches deep, is dug round, and nearly close to it, which serves to convey all the water from the spot, and renders it perfectly dry and secure.

It is of great advantage to the farmer to give constant personal attendance to every party, directing each operation during the whole hay-harvest. The man who would cure his hay in the best manner, and at a moderate expense, must not only urge the persons who make the hay, the men who load the waggons, and those who make the stack, but he should be on the alert to contrive and point out the manner in which every person may do his labour to the most advantage. Unless he does this, one moiety of the people in his hay-field will be of no material use to him; and if he should be absent for an hour, or more,

during that time little or nothing will be done. The farmers of Middlesex engage many hay-makers: some of them have been known to employ two or three hundred: such men find it necessary to be on horseback, and the work-people find them sufficient employment. A man of energy will make the most of every hour, and secure his hay while the sun shines: one of an opposite description lounges his time away, and suffers his hay to be caught in the rain, by which it is frequently half spoiled. Or if the latter should have the good fortune of a continuance of dry weather, his hay will be a week longer in the field than his neighbour's, and the sap of it dried up by the sun.

It is supposed that 400 of grass, on being dried into hay, wastes to 100 by the time it is laid on the stack; it is then further reduced by heat and evaporation in about a month to perhaps 95; and between that and 90 I apprehend it continues through the winter. From the middle of March till September, the operations of trussing and marketing expose it so much to the sun and wind, as to render it considerably lighter, probably 80: that is, hay which would weigh 90 the instant it is separated from the stack, would waste to 80 (in trussing, exposure on the road and at market for about 24 hours) by the time it is usually delivered to a purchaser. During the following winter the waste will be little or nothing: it is nearly obvious, that the same hay will weigh on delivery 80 in summer and 90 in winter. From this circumstance, and others which relate to price, a farmer may determine what season of the year is the most advisable for him to sell his hay. I have known a gentleman have the hay of five years by him at one time; the price then rose, and he sold it to much advantage. And I now know there are

are several farmers in this county, who have from one to two thousand tons of hay.

In the neighbourhood of Harrow, Hendon, and Finchley, there are many hay-barns capable of holding from 30 to 50, and some even 100 loads of hay. They are found to be extremely useful and convenient during a catching and unsettled hay-harvest, as a safe receptacle for the hay as fast as it becomes dry. In the very common case of approaching rain, when the hay is fit for carrying, every nerve is, or ought to be, exerted to secure as much as possible; and that is most effectually done by getting all the carts and waggons loaded, and drawn into the barns: the rest of the hay must take its chance in large cocks. These barns are also of considerable utility for the reception of loaded carriages daily, a short time before night, where they are secure, and afford certain employment for the men the next morning, before breakfast, in unloading. Even in dull or damp mornings, the hay can be safely unloaded under the cover of these buildings, when it could not be done on to a stack in an exposed yard. I remember a morning of this kind which threatened rain, in which my neighbours durst not uncover their stacks, when, under the security of a hay-barn, I unloaded twelve carts and waggons before the men went to breakfast: the day turned out fine, and my people were all ready for the hay-field, where they re-loaded the carriages into the same barns before night.

In winter, and in all wet and windy weather, the barns afford safety to the broken cuts, and an opportunity of cutting, weighing, and binding hay; none of which operations could, at such a time, be performed out of doors. The farmers whom I have consulted on this subject, agree that hay may be put together earlier,

:ven by a day, in a barn, than it would be safe to do in a stack.

The expense of a hay-barn, which costs 100*l.* generally saves, in straw and thatching, and its other advantages, the whole of its cost in three years. Indeed, I built one on oak posts in the most complete manner, which holds 100 loads of hay, and am certain its savings equalled its cost in two years; but in this it was aided by the then high price of straw.

In the driest seasons, barns are a saving of 6*s.* or more per acre; and in wet seasons, the ready assistance which they afford in speedily securing the hay, has been known to make a difference in price of 20*s.* per load, on a small number of loads.

Close barns exclude the current of external air, which is, probably, the immediate cause of the ignition of the hot vapour, at the instant of its escape from the hay-stack. In the barn, this hot vapour, or steam, is confined in the empty space between the hay and the roof, until it has parted with so much heat, as to be incapable of taking fire when it comes in contact with the external air in its escape from the barn.

The Middlesex farmers are desirous of preserving the green colour of their hay as much as possible; though a *lightish* brown is of no dis-service to it. Hay of a *deep* brown colour, occasioned by its having heated too much in the stack, is said to weaken the horses that eat it, by promoting an excess of urine, and consequently it sells at a reduced price. 'If you would make your hay come out of the stack of a fine colour, and the beauty of the flowers to appear, the hay you have shaken out of bastard cocks to prepare for carting, should be cocked in the heat, and remain till the next morning; then turn and open the cocks, for the air to take away the damp that is collected,

lected, which otherwise would heat in the stack, and, of course, the beauty of the colour would be done away.' —*Board of Agriculture.*

The after-grass is fed off by heavy cattle, till such time as the land would receive injury by their poaching, were they continued in it; and after that, by sheep till Candlemas. It seems to be equally as erroneous to turn cattle into a close as soon as the hay is carried, as to keep them out of it till the after-grass be overgrown. It is obviously much better to forbear so long as may be necessary to permit the after-grass to rise, till it provide just a sufficient bite for the cattle.

In the making of hay, some attention should be paid to the quality of the soil, and the kind of herbage growing on it. *The hard benty hay of a poor soil, is in little or no danger of firing in the stack; and should,* therefore, *be put very early together, in order to promote a considerable perspiration, as the only means of imparting a flavour to such hay, which will make it agreeable to horses and lean cattle:* it will be nearly unfit for every other sort of stock.

It is the succulent herbage of rich land, or land highly manured, that is more likely to generate heat sufficient to burst into flame, as it has sometimes done; of course, the grass from such land must have more time allowed in making it into hay. This the Middlesex farmers are perfectly aware of; and, when the weather proves moderately drying, they make most excellent hay. But when it is very hot or scorching, they, as well as most other farmers under similar circumstances, are sometimes mistaken. In such weather the grass becomes crisp, rustles, and handles like hay, before the sap is sufficiently dissipated for it to be in a state fit to be put into large stacks; and, if that be done when it is thus insufficiently made, it generally heats too much; has been known to become *mow-burnt*, and

and in some cases, though very rarely, has taken fire *.

Salt ought to be spread by hand in the stack, with hay that is damaged by any cause whatever, as, being nearly spoiled during the making, or being naturally too bulky and coarse in the crop, or tasteless from poverty of soil. The effect will be so great, that it is said even sheep will eat every morsel of it †. Salt has also the valuable property of keeping hay from heating too much in the stack, and, by that means, preserving it of a finer green colour than it would otherwise be of. Its disposition to prevent heat is so great, as to be particularly suitable and valuable in every case where it may be suspected the hay is putting together insufficiently made. Clover-hay, and tare-hay, are more subject to heat too much than almost any other, owing to their being more succulent and sappy; and many of the farmers of this county use salt on such occasions, with good effect, to keep down the heat.

The great quantity they have in hand at the same time, makes it extremely difficult to carry the whole just at the moment it is sufficiently made; although it is certainly of considerable consequence that it should be so, *in order to its yielding the greatest possible weight, and preserving its best quality;* as, every minute after that precise time, it continues to lose, both in weight and in its nutritious properties, by evaporation ‡. *Even the difference of an hour, in a very hot drying day, is supposed to occasion a loss of* 15 *or* 20 *per cent. on the hay, by its being carried beyond the point of perfection;* and frequently even a greater loss is

* Hay stacked in a barn in the same state, would not heat too much; and as to firing, no such thing was ever known.—*J. M.*

† Half a bushel to a load is used by some persons.—*Notts*, p. 127.

‡ Every thing we smell affords proof positive, that more than watery particles evaporate.—*J. M.*

sustained.

sustained. Hence the importance, to a hay-farmer, having a machine calculated to put the hay together with great dispatch, and just at the right time. (See my description of a Sweep, in vol. xiv. Transactions of London Society of Arts, &c.)

It is very truly remarked, that there are more hay-stacks fired in a fine dry summer than a wet one; and various are the methods* used in different places, to prevent hay from taking fire in the stack, by drawing off the hot vapour or steam; but the misfortune is, that all of them are sure to produce mouldy and bad hay on every side of such vents; and of course they are justly reprobated by every good hay-maker, and should only be resorted to in cases of necessity†.

It is determined by general experience, that *hay* which has not been exposed to rain at all, is much more liable to fire in the stack than that which has been *drenched* with it. Indeed the latter seldom heats so much as the farmers wish it to do, since a moderate degree of heat would improve its flavour; *but that is prevented by its becoming too much made during every process yet known for drying it.* On the contrary, *all such hay as is put into the stack without being skin-dry, universally becomes coated with a stinking mould, or dust.*

---

* Such as square troughs, bored full of holes; or two opposite boards, secured about nine inches apart by short laths nailed on them; or by drawing up the middle of the stack, a basket or sack, filled with straw or hay. Some persons, on discovering that the stack heats too much, cut a square hole from the top to the bottom of it.—*J. M.*

† The bands for binding trusses are made of the most dusty, coarse, and ordinary hay. A stack of forty loads will require two loads of binders; therefore two loads of dusty, &c. hay, in such a stack, is not any loss to the farmer.—*J. M.*

SECT.

SECT. IV.—FEEDING.

DO not know of any land in this county being applied
ıe fattening of cattle for the butcher. Indeed the
nce can always be sold for ready money, at such high
:s, as to render any system of grazing a losing business.
ıllock would eat as much hay, turnips, oil-cake, &c.
week, as could be sold for twelve shillings; and he
:d probably increase in value in that time about six.
ourse the farmer would lose six shillings a week per
. by feeding bullocks; and sheep would occasion a
ortionate loss.

ım fully persuaded that all the straw and haulm in the
dom, over and above what is indispensably necessary
hatching buildings and littering cattle, might be easily
erted into wholesome food, and made to contribute
rially towards the rearing and support of lean stock,
ıe simple operation of cutting it into chaff; and, in
: cases, by the commixture of roots and other articles,
rder to render it more palatable, and to induce the
: to eat an increased quantity. When so prepared,
ıuld be given to them in mangers of rather a large
and calculated to prevent waste. There can be no
t but this method of preparing and consuming straw,
n, &c. would tend considerably to increase the num-
f black cattle; and, when compared with the present
ice of treading and rotting it into manure, one moiety
ıich is washed into the ditches, and leaves the rest
poor quality, must be considered of great national
rtance. Thus the straw, &c. is not only rendered fit
ıe support of live stock, but, by being digested, and
d through their bodies, it must become a much more

highly enriched manure than in the ordinary way of treading and rotting.

The astonishing increase that would probably take place in the number of stock, in consequence of this mode of feeding, would effectually reduce the price of lean neat cattle, and consequently the price of butchers'-meat in general.

Cut straw is also found to be extremely useful for bullocks, while fattening for the butcher on roots, oil-cake, distillers' wash, or indeed any soft food which does not admit of chewing the cud; as this defect may be as well corrected by the use of chopped straw, in the way just mentioned, as by that of any other and more expensive diet.

Varying the food of stock, while fattening, as much as possible, is allowed to promote quick feeding in a great degree. This variety may easily be furnished by a judicious mixture of the several articles adapted to that purpose, and the quality at the same time may be considerably improved.

Some kinds of food, that are loathed by cattle while in an *unmixed* state, are rendered both palatable and nutritious, by being *incorporated* with other articles. Even oil has been found greatly nutritive, merely by having been mixed with bran, and given to cattle. It is supposed that lint-seed is more fattening than any other, which is probably owing to its containing a larger portion of oil. Melasses has also been given with boiled Indian corn, and found to fatten oxen very quickly.

For the probably great use of mixing salt with the food of neat cattle and sheep during the time they are fattening, see Annals of Agriculture, vol. xxiv. p. 422.

During a late war, an astonishing quantity of hay was exported from this county to the armies in Germany, after having been previously compressed into about one-

third

f its natural compass, by means of the double screw
ı common use among the packers. This method
ı even the most bulky articles infinitely more con-
and portable, and consequently better calculated
ıveyance from one place to another, either when
-board or in camp; as it is evident they may be
d with much greater ease and alacrity when so
ssed than could otherwise be the case.

straw, or indeed any article capable of sustaining
essary pressure, might, after being thus reduced in
: bulk, be much more readily conveyed, either by
water carriage, with less than half the number of
s, horses, and boats, now in general use for that
:.

CHAP. IX.

GARDENS AND ORCHARDS.

SECT. I.—FRUIT-GARDENS.

.OM Kensington, through Hammersmith, Chis-
rentford, Isleworth, and Twickenham, the land on
les of the road, for seven miles in length, or a
of ten miles from market, may be denominated
t fruit-garden, north of the Thames, for the sup-

ply of London*. In this manner much of the ground in these parishes is cultivated. The pleasure-grounds and villas of some of the nobility, and wealthy commoners, comprize most of the remainder of this district.

The *fruit-gardeners* have what they call an *upper* and *under* crop growing on the same ground *at one time*. First, the ground is stocked with apples, pears, cherries, plums, walnuts, &c. like a complete orchard, which they call the *upper* crop. It is, secondly, fully planted with raspberries, gooseberries, currants, strawberries, and all such fruit, shrubs, and herbs, as are known to sustain the shade and drip from the trees above them, with the least injury. This they term the *under* crop. Some of these gardens have walls, which are completely clothed with wall-fruits; such as nectarines, peaches, apricots, plums, and various others, all properly adapted to the aspect of the wall. In order to increase the quantity of shelter and warmth in autumn, they raise earthen banks of about three feet high, laid to a slope of about 45° to the sun. On these slopes they plant endive in the month of September; and near the bottom of them, from October till Christmas, they drill a row of pease. By this means the endive is preserved from rotting; and, as well as the pease, comes to maturity nearly as early as if they had been planted in borders under a wall.

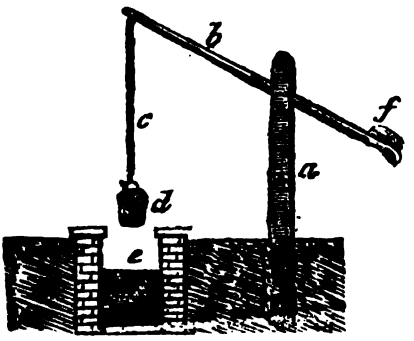
Soil.—The soil is an excellent dry loam, annually dug and repeatedly hoed, so as to keep it free from weeds.

Water.—The springs of this district lie at eight or ten feet in depth; and the manner of raising the water is pe-

* There are also considerable fruit-gardens on the Surrey, or south side of the Thames.—*J. M.*

culiar

culiar to gardeners. For cheapness of machinery, and dispatch, it exceeds the pump or the roller. It consists of a principal post set firmly in the ground a small distance from the well, and about eight feet out of the ground, as at *a*. In the top of this post, a baulk, or ufer, *b*, turns on an iron pin. To the smaller end of this baulk is hung a pole, *c*, and to this is suspended the pail, *d*, which, when empty, swings over the well, *e*. In order to raise the water by this apparatus, a person takes hold of the pole, and pulls it down until the bucket descends into the water, and is filled, when a small force at *c* lifts it up again, as it is assisted by the weight at *f*.



I suppose there are upwards of three thousand acres of land under this most excellent and valuable management. The quantity of productive labour depending on these gardens is surprizing. The digging, hoeing, trenching, harrowing, planting, grafting, pruning, budding, gathering, and marketing the fruit; and also carrying it from market to the dealers in every part of the town; and in crying it for sale daily through six or seven thousand streets in London; must supply a wonderful quantity of labour and profit to numerous individuals.

They probably give employment and support, in the garden, to *five persons* (a man, his wife, and three children) *per acre, during the winter half year;* and in summer, about five persons more (chiefly Welsh women) are added

to the number; while the market-people, porters, basket-women, dealers, and hawkers, may be estimated at *five* more. The last ten are all men and women whose families equal their own number, or may be twenty. Thus the whole probably amount to *about thirty-five inhabitants per acre during the fruit season.*

Many of them do not depend solely on the fruit-gardens: but, *if I may be allowed to average the number at ten per acre, they would give thirty thousand inhabitants as being entirely supported by the labour of these gardens*; exclusive of the persons depending on the rent, taxes, and tithes of the land.

Estimating their produce in money, it cannot be less than 100*l. per acre*, or 300,000*l.* per annum.

The fruit-gardens of Surrey are of considerable extent, and cultivated in the same manner as those of Middlesex. And as much is also brought from Kent, Essex, Berks, and other counties, for the supply of the London markets, to the amount of at least one-third of the produce of this county, *the consumption of the metropolis and its environs must be* 400,000*l. per annum.*

Fruit-trees are of many species, and their varieties are so numerous, as entirely to preclude the idea of describing them severally in a work of this kind: indeed, they are highly deserving of being made the subject of a distinct publication. Mr. FORSYTH, gardener to THE KING at Kensington-palace, has lately published his methods of managing fruit and forest trees, with drawings and descriptions, sufficiently perspicuous to enable any person, of a sound understanding, to follow his valuable methods.

Many persons are in habits of making wine from English grapes, which ought to be encouraged by all means: a Mr. JESSOP, of this county, has been known to make

100

100 gallons from the grapes grown on as many yards of wall.

The inhabitants of Britain, from Mr. FORSYTH's book, may learn the culture of the grape, and it certainly is very possible to make as palatable, and much more wholesome, wine in England, than what is generally imported. It is well known, that wine may be made of the English sweet-water grape, equal to mountain; and it is almost equally well known, that much of the colour, and nearly all the sediment, or tartar, and part of the flavour, of red wine, are obtained by the addition of unwholesome drugs, which have destroyed some persons in a few hours; others in a few days, and reduced the duration of life in thousands to half the number of years which they might otherwise have attained. This practice ought to be discouraged, or it will determine every man who has any regard for his health, to refrain from drinking such wine, at least until it has been kept a sufficient number of years to procure the deposit and concretion of the poisonous ingredients that have been obtruded into it.

The orchards and fruit-gardens of these kingdoms are a considerable branch of its agriculture; and it is expected the standard fruit-trees will, in a few years, be much improved from the exertions of T. S. D. BUCKNALL, Esq. who has been very assiduous in establishing the science of orcharding upon more rational principles than had before been done in this kingdom.

Several of Mr. BUCKNALL's papers on this subject were published in the 11th, 12th, 13th, and 14th volumes of the Transactions of the Society for the Encouragement of Arts, &c. containing the practice which he introduced at Sittingbourne, in the county of Kent, in the year 1790; which papers have been reprinted in a pamphlet published by G. NICOL, in Pall-mall.

In this book, are observations on the suitable manure all that should be done in order to render most tre healthy, large, handsome, and productive, is fully poin out; many useful hints are given to guard the planters a fruit-growers against the usual effects of neglect and m take; and much stress is laid on the proper soil, positi and judicious shelter. The operative part is expressed so clear a manner, that it can hardly be misunderstoo nor can I sufficiently recommend the pamphlet, whi should be read by every fruit-grower.

SECT. II.—KITCHEN-GARDENS.

THE *Kitchen-Gardener*, conscious that he cannot r his goods to the highest state of perfection without most liberal use of dung, is not sparing in the expens procuring a sufficient quantity; nor is he saving in labour of managing his dunghill, when it is procured.

This dunghill consists of new horse-dung and lit brought from the stables, and shot immediately from carts in which it is brought, into an oblong heap. this is daily added, what is brought home in the carts their return from town, until twelve, fourteen, or sixt days* before it is wanted; at which time, so much o as the gardener thinks necessary for his immediate p pose, is shook to pieces into a separate heap, turning

* Whether it should be twelve, fourteen, or sixteen days, depe the judgment of the gardener. If it be long, sound litter, it will re sixteen days; if short, and partly rotten, it need only be twelve and if in a medium state between the two, it should lie fourteen d *J. M.*

the long litter into the middle, and the short litter and shovelings to the outside. This being done, it is left in the lightest manner, to permit the hot, putrid, offensive vapour freely to escape; which it does very copiously in a few days. It will then be fit to be turned, and shaken up, as before, in about eight days; and when so done, it is left for four, six, or eight days more, according to the state of the manure, as aforesaid.

To fit it for use in the winter season, no water is necessary; but in drying weather, during summer, when the heap would be more likely to turn of a dusty mould than to putrify, they add water from a garden-pot, just enough to secure putrefaction, and to give time for the air, which it discharges during that process, to escape; as that would otherwise fill their frames with an insufferable stench.

The dung thus reduced and prepared, is fit for the formation of hot-beds.

When intended for the purpose of raising mushrooms, a large surface becomes an object, and the bed is therefore made twenty, forty, or more yards in length. A transverse section of this bed would be of a triangular form, thus:

When it is intended that the bed should be covered with glazed frames, it is prepared in the form of a parallelogram; and in this last shape it is usually made for the raising of most kinds of seeds.

Small salad is raised under these glazed frames; *and a fresh crop is sown, cut, and marketed, every fortnight.* The crop being divided into a regular succession, produces a daily supply.

The moderate heat arising from the constant putrefaction of the dung under these frames, during every fortnight or three weeks, forces a succession of seeds into plants,

plants, of about six inches high, fit to be transplanted: which heat, when necessary, is increased by lining the frames (*i. e.* laying stable-litter to the back and front edges of the hot-beds), and so continued until the end of the season. When the dung has done working, the frames being removed, it is dug up, and barrowed to a dunghill, where fresh horse-dung is mixed with it, and, after being all rotted together, it is trenched into the quarters. *Thus, in one season, it contributes to raising the seedling plants; and in the next, to force other plants into maturity.*

When the quantity of dung returned from the hot-beds exceeds the demands of the ground, they sell it to common farmers: in this case, giving preference to dung that has not been worked, for their own use. The farmer ought also to estimate the difference.

OBSERVATIONS ON THE GARDENS AT THE NEAT-HOUSES, LYING BETWEEN WESTMINSTER AND CHELSEA.

This soil, no doubt, originally consisted of the sediment deposited there from the richly impregnated water of the Thames; and, like the other marsh-land on both sides of that river, is secured against inundation with *an earthen bank*, or, as it is elsewhere called, a *sea wall*. The time, or period, when these walls were constructed, is one of those events on which history is silent. I have heard it said, *that much of the base and centre of them consists of chalk, which substance was probably made use of for the purpose of keeping out moles, rats, and worms.*

Most of the land thus secured against floods, is of the richest quality, and peculiarly suited to the purposes of a kitchen-gardener. In the situation now under review, the

piers can, by a little attention to the sluices, fill ches, dip-holes, and wells, with Thames water, in it in such places to within about eighteen inches rface, and by that means save a great deal of n watering their crops. In addition to this, r they use (from the Thames) is also of a more g quality than can be met with in most other

and has been as long, or perhaps longer, in the n of kitchen-gardeners, as any other land in and for a great length of time has been supplied g, as much in quantity, and as often repeated, e opinion of the occupiers, could be applied with e to the crops. The quantity thus used is annu- ards of 60 cart-loads per acre*.

by an union of *natural fertility with heat* (raised , and a due degree of *moisture*, are the occupiers grounds enabled to raise the *greatest* crops in the ible time. This district being also nearer the han most others, it has, from a combination of antages, a decided preference over every district ingdom†.

—Soon after Christmas, when the weather is ey begin by sowing the borders, and then the

---

ardener to whom I am indebted for most of this account, loads of dung annually from town, and uses it all on nine ound. These carts are drawn by two horses, and the loads alf the size which the farmers draw to greater distances with ur horses.—*J. M.*

so situate on the south-west border of the town, consequently the north-east wind, so hurtful to vegetation in exposed situ- onsiderably moderated, or rarefied, before it passes over these they are also naturally low and sheltered.—*J. M.*

quarters,

quarters, with radishes, spinach, onions, and all the other *seed* crops. As soon afterwards as the season will permit, which is generally in February, the same ground is planted with cauliflowers, from the frames, as thick as if no other crop then had possession of the ground. The radishes, &c. are soon sent to market; and when the cauliflowers are so far advanced as to be earthed up, sugar-loaf cabbages are planted from the aforesaid *seed* crops. When these are marketed, the stalks are taken up, the ground cleared, and planted with endive and celery from the said *seed* crop; and daily as these crops are sent to market, the same ground is cropped with celery for winter use.

The foregoing rotation, or order, in which the land is cropped, may be considered as the general practice of the gardeners of this district, although there are individuals who differ from it in several respects; as the state of the markets, the price of the articles, or their own inclination and opinion direct them. But one thing they unanimously agree in, namely, that *to dung plentifully, to dig the soil well, and to sow good seed*, is the only practice on which a reasonable expectation of good and plentiful crops can be founded.

Next to the grand object of good land, clean, full of dung, and but little above the water, the kitchen-gardener esteems shelter from cold winds as highly essential towards bringing his crops rapidly forward, and into the highest state of perfection. Hence it has been the constant practice, in order to attain this desirable object, to erect a considerable number of reed fences (though they have lately substituted paled fences in their stead), which they place in such positions as are best calculated to prevent the currents of cold chilling winds from passing over their grounds.

The

: following estimate was made by a gardener who ed nine acres, situate about two miles farther from t, as his opinion of the produce of the soil at the ıouses before-mentioned, viz.

: radishes, &c.	£.10
liflowers, frequently 70 or more, but say	60
bages,	30
:ry, the *first* crop, not unfrequently upwards f 60, but say	50
live,	30
:ry, the *second* crop,	40
Total annual produce of one acre,	£.220

s he stated as an estimate rather under the mark. seasons occasion a considerable loss, perhaps of one but as this does not often occur, he was of opinion ıpon the whole, *two hundred pounds an acre was low estimate of the average annual produce of these s.*

:h the produce or amount of a gardener's crops, I ; I am not *practically* acquainted ; and therefore I ıeg, that the foregoing account may be taken as the of the inquiries which I have been able to make.

: very great expense, in labour, manure, &c. kitchen-gardeners are at, is evident to every one ives in the neighbourhood of them. Probably it : thus divided, viz. in labour, 35*l.*; teams and 25*l.*; rent, taxes, and tithes, 12*l.*; marketing ɛpenses, 8*l.*—together, 80*l.*; which, taken from regoing sum of 200*l.* leaves 120*l.* per acre as in- ıf capital, and profit.

The

The farming gardeners, or those who work their soil principally with the plough, are situated rather more distant from London; occupy larger tracts of land; and are content to follow something like the following method or order of cropping, namely:—in the months of January and February, they crop their land with *early pease*, in order to have the pods gathered green, and sold in the month of June. The haulm is hooked up, and, as soon as it is dry, is carried off the ground, and stacked, for the fodder of horses, on which they thrive nearly as well as on hay. The ground being cleared, is ploughed, and sown with *turnips**, which are sold off in autumn; at which time the ground is again ploughed, and planted with *collards*.

When the crop of pease is of the marrowfat kind, they do not come so early as before-mentioned, and are, therefore, generally succeeded by a crop of savoys, or late cabbages.

In gathering green pease, six or seven acres will employ twenty persons, daily (Sundays not excepted), and they are paid from one shilling to sixteen or eighteen-pence per sack of four bushels, for gathering them. The price varies according to the bulk of the crop, and also according to the kind of pea, or size of the pods. Those of the marrowfat, or larger kind, at one shilling, and the smaller sort at sixteen or eighteen-pence per sack. They are sent to market in these sacks, by both land and water carriage, from every distance, perhaps, not exceeding twenty-five miles, and are sold in the market at, from five to seven-

* All these operations are done in a few days, or finished within a week from the time when the last peas of the piece of land are gathered.—J. A.

teen

n shillings per sack: in which manner this crop returns m less than five, to upwards of 20*l.* per acre*.

Turnips are pulled up by the hand, the tap-root cut off, shed, and tied in bunches, of ten or twelve in each. ey are then sent to market in carts, which carry about ty dozen of these bunches, and thus produce from two four guineas each load, or from twenty to upwards of y pounds per acre.

I think there are about eight thousand acres in four nties† cultivated in this manner, producing, per acre, ut fifty pounds.

There are perhaps thirteen hundred acres in the vici-y of London, cultivated by the spade in the most per-t manner, which do not possess the advantages which

---

The produce of a field of six acres, in June 1796, that was not at all arkable for more than a common crop:

				£.	s.	d.
mber, 40 sacks, of four bushels each, of pods sent to market, and sold from 6*s.* to 12*s.*; average 7*s.* 6*d.* each,				15	0	0
ulm, stacked and given to draught-horses, one ton per cre, worth two-thirds as much as hay, but say only				3	0	0
Produce - - - - - -				£.18	0	0
PENSES—Ploughing once from clover-ley, -	0	10	0			
Seed, four bushels, at 12*s.* -	2	8	0			
Drilling, covering, &c. - -	0	7	0			
Hoeing twice, - - - -	0	10	0			
Podding, at 18*d.* per sack, on 40,	3	0	0			
Marketing, distance ten miles, land carriage, - - -	1	5	0			
				8	0	0
Remains - - - - - -				£.10	0	0

† Middlesex, - - - - - -	1800	acres.
Surrey, - - - - -	3500	
Kent, - - - - - - -	1700	
Essex, - - - - - - -	1000	
	8000	

I have

I have before stated to belong to the soil at the Neat-houses, but which are rather under the medium between the soil at the Neat-houses and the land occupied by the farming gardeners, producing an hundred pounds per acre.

There are also about five hundred acres more, which, possessing some of the advantages of the soil at the Neat-houses, hold a medium station between that and the last-mentioned thirteen hundred acres, and which, being cultivated in the same manner, produce a return of about one hundred and fifty pounds an acre. This sum is disposed of thus, viz. in labour 40*l.*; in teams and dung, 25*l.*; marketing and expenses, 5*l.*; rent, taxes, and tithes, 10*l.*;—together, 80*l.* leaving for interest of capital, and profit, 70*l.* per acre.

RECAPITULATION.

Gardens at the Neat-houses	200 acres, at 200*l.* per acre, -	£.40,000
Surrey side of the Thames	500 acres, at 150*l.* - -	75,000
Round the outskirts of London, in 4 counties	1300 acres, at 100*l.* - -	130,000
Wholly cultivated by the spade - -	2000 acres, at the average produce of 120*l.* 10*s.* per acre,	£.245,000
Farming gardeners; their land partly cultivated by the spade, but mostly by the plough, -	8000 acres, at 50*l.* per acre, -	400,000
Total,	10,000 acres, producing annually	£.645,000
To which sum add for fruit-gardens - - - -		400,000
		£.1,045,000

And the total will show, that *the consumption of the metropolis and its environs, in fruits and vegetables, is upwards of one million pounds sterling per annum.*

I think these several estimates cannot be too high for the produce raised by the labour of the kitchen-gardeners round London; as they are known to live, and provide as well for their families, on five acres of the best ground, nine

ie acres of the second best, or twenty acres of an infe-
r soil, as the generality of farmers can on one hundred
l fifty or two hundred acres. This cannot fail of
cing *the gardener's art* in the most favourable point of
w; as *no other application of land, nor of labour, does, or
supply, so large a surplus-revenue towards supporting the
-productive part of the community.* The labour and profit
the dealers, the porterage and additional carriage,
atly increase this sum to the consumers; but in what
tio or proportion, I have not been able to learn; though,
the article of *turnips*, I have known the farming gardener
receive *forty-five pounds per acre* for that commodity,
hen the consumer was paying to the retailer after the
te of *one hundred and fifty pounds per acre**. In other
ticles, no doubt, something like the same proportion
lds good. Upon mentioning this to a gardener, he re-
ied, 'No, no; not so much as that, neither.' The same
rson observed, that the retailers who keep shops and
nds, never buy more than they know they can sell
ll. And therefore both growers and consumers are
ch indebted, for the moderate price, and the conse-
nt increased consumption, to the jack-ass drivers, bar-
r-women, and other itinerant dealers in these articles,
o buy of the gardeners in the market, and hawk
ough the streets of London, and its environs, vege-
les and fruit at a moderate price.

That gardening is not altogether an unprofitable con-
n (as Dr. ADAM SMITH has represented it to be),
have ample proof, both in Middlesex and Surrey.
ere are generally some gardeners in the commission of

* Four hundred and eighty (40 dozen) bunches, at 1½*d.* is 3*l.* a cart-
d; fifteen such loads per acre, is 45*l.* They were retailed at 5*d.* which
t the rate of 150*l.* per acre.—*J. M.*

the peace. It has produced several sheriffs of counties and others who have realized from 40 to upwards of 100,000*l.* in addition to their patrimony*.

SECT. III.—NURSERY-GROUNDS.

At Chelsea, Brompton, Kensington, Hackney, Dalston, Bow, and Mile-End, much ground is occupied by nurserymen, who spare no expense in collecting the choicest sort, and the greatest variety, of fruit-trees, and ornamental shrubs and flowers, from every quarter of the globe, and which they cultivate in a high degree of perfection; the latter to a very great extent, and to almost an endless variety, so that to attempt a particular description of them here, would not only be a work of much time,

* Mr. Ruberry, of Little Sutton, in this county, is said to have at this time upwards of eighty acres cropped with asparagus, which is supposed to cost 100*l.* an acre in making. The labour is afterwards contracted for at 50*s.* per acre per annum, except cutting and marketing. It is very profitable on sandy land; in kindly-growing seasons, cutting twice in twenty-four hours. Some persons say it will produce to the cultivator upwards of 50*l.* per acre per annum, with less expense than attends most other crops.

Mr. Adams, of East Sheen, Surrey, has sixty acres freehold land cropped with asparagus, all of his own planting, by which he has acquired a large fortune.

Mr. Edmonds, of New-cross, Deptford, amassed a large property, as a general kitchen-gardener, which profession he followed to a great extent; and which business is now carried on by the same family, in the same extensive manner.

There are several farming-gardeners in this county, who pay a thousand pounds annual rent; and of cow-keepers, who pay a rent of two thousand pounds. The returns of such men must be many thousand pounds per annum.—*J. M.*

but

art would also be foreign to the nature of this undertaking.

Many of them are annually exported to Ireland, Spain, Portugal, Italy, Russia, and, until lately, to France; but there are still greater quantities sold for use in this country.

Soil.—The most general opinion of the trade seems to be, that the best soil for a nursery, is that which would be the most desirable for the general purposes of agriculture, namely, a good loam fresh broken up from old pasture; which may be true, as to the nurseries producing abundance of thriving plants; but otherwise, as to the success of the timber trees to be raised from such plants, Mr. BAIRD very justly observes, 'that it does not appear to be a safe or eligible plan, to trust to the forest-timber plants raised in grounds so near London, especially when they are to be planted out upon a poor soil, and more exposed situations, as it is obvious that plants raised in a mild climate, as it were in hot-beds, and too hastily brought forward by the force of manure, will make but a slow and sickly progress when transplanted to a less rich soil and more unkindly climate*.

'It is therefore suggested to gentlemen who have it in contemplation to become considerable planters, to turn

* Upon this opinion I met with the following observation in one of the returned Reports, viz. 'The author adopts here the common, but ill-founded, opinion, concerning the soil of nursery-grounds; an opinion which must appear very plausible, and prove captivating, to the uninformed, for the reason he gives. But the young tree of the best growth, and with the most roots, which can only be obtained in the richest soil, will always thrive best in whatever soil it is planted. As, on the other hand, a tree stunted in the poor soil of a nursery will never make a free growing and vigorous plant in any situation.'

their attention to raising their own plants and trees. By adopting this plan, they will find not only a very great saving in point of expense, but prodigious satisfaction afterwards, in the health and future successful progress of their plantations.'

In my opinion, no one soil can be the most suitable for plants of every genus. One delights in a dry soil, another in a moist one, and some even in water; nay, two plants, which require a soil equally dry, may be so opposite in their feeding powers, as that one shall flourish in a situation where the other would inevitably perish. As for example, a dry black peat earth *naturally* produces heath, and is an enemy to white clover; but upon applying lime in a proper quantity on this land, the heath would perish, and white clover would then succeed.

The beech and the willow are never found in a state of nature in the same place; nor are the elm and the pine in such a situation the neighbours of each other. An attentive observation of the natural products of different soils, would convince *even a St. Thomas*, that no one soil, and perhaps not one nursery, can be most fit for raising every tree of the forest kind. No person, competent to make the observation, can ride over a large estate, without observing that the trees vary according to the nature of the soil.

Every marsh of a certain degree of wetness, presents to us the willow and the alder. Where the soil is rather more dry, the elm and the ash are the natural growth of it; as the soil becomes still further removed from the marsh, the oak is found to succeed; a little further on, if the soil is dry and calcareous, the beech is found; should a poor free-stone gravel or sand succeed to this, there will be seen the fir.

I have observed all these changes in the distance of a mile;

e; and that planter will certainly stand the fairest ınce of success, who follows this order of nature; or east, who avoids planting in direct opposition to it.

Every wood-cutter knows, that oaks which have been ıed into timber under a certain degree of shelter, would se to thrive, if deprived of that shelter.

Experience plainly shews, that trees and plants are as ceptible of injury, from every sudden and extreme ınge in their habits, as is the human frame itself. Hence : importance of well considering the nature of the cli- te. Its degree of shelter and warmth should not, in : nursery, exceed what the tree will meet with after ng transplanted; but, on the contrary, if the nursery ıuld be in the more exposed situation of the two, the es will be the more likely to succeed in the plantation.

When a gentleman has determined to raise a plantation, business is to look out for *nursery-grounds whose climates rather worse, and soils rather better, than his own;* and such grounds to select the most healthy and thriving nts. If no such nurseries are to be found, the only ıedy will be, to appropriate a part of his own ground, cumstanced as aforesaid, for the purpose of raising a ficient number of plants for the proposed plantation*.

The methods of raising timber plants, fruit-trees, and ıamental shrubs, are many and various; such as sow- ;, laying, cutting, grafting, budding, &c. but for a rticular description of these several operations, ample

* 'The plants should be healthy, straight, and firmly set; not drawn up luxuriantly, but raised in a soil of a similar quality and temperature that wherein they are intended to be planted. This is a very neces- y caution, as they will hence be much more likely to flourish, than if y should have been raised in a richer soil or warmer situation.'—*Notts*, 55.

information may be obtained by reference to those authors who have written expressly on such subjects.

It is supposed there are about 1500 acres of nursery ground in this county; and that, including the hot-houses and green-houses belonging to them, they produce nearly 50*l.* each, or 75,000*l.* a year.

CHAP. X.

COPSES, WOODS, PLANTATIONS, HEDGE-ROWS, AND OZIERS.

THE *copses and woods* of this county have been decreasing for ages; and, in a few centuries more, they will probably be annihilated.

There are, however, still a few acres so occupied on the north slopes of Hampstead and Highgate hills; about one hundred acres on the east side of Finchley-common; and two thousand acres on the north-west side of Ryslip; together about three thousand acres. Rather more than half the said quantity is wood, pretty well stocked with thriving young oaks; the rest is copse. I believe the whole is on a soil of yellow clay; which, at present, would not pay for the trouble and expense of clearing, and putting into a state of aration; at least, not if continued under the plough longer than would be necessary to lay it down in the best manner to *grass*; but in *that* state, it would

would produce to the community from five, to ten times as much as it does now*.

The hills about Copthall and Hornsey are now appropriated to the scythe; though, but a few years ago, they were covered with wood. They are already of five times their former value; and, after being ten years more in grass, their produce will be worth, to the community, ten times more than the produce of the same ground would have been in a state of wood. Near Bowes Farm, several hundred acres of underwood have been grubbed up within the last eight or ten years; and the improvement of the soil is going on in a proportion nearly similar to the foregoing.

It is a matter of regret, that while the national councils are ringing the alarm of an apprehended approaching want of timber, *most of the ancient parks are disfigured with trees that are mutilated, ruptured, and rotting as they stand. How much superior is the scene, where the trees are from twenty to fifty years old, perfect in every branch; healthy, beautiful, and profitable.*

Every acre of this county ought to be appropriated to the production of more valuable crops than timber and underwood. Surely copses, woods, and large plantations, should be raised in rocky soils; on the steep sides and *tops* of hills; and as high up the *sides* of mountains as there might appear to be any prospect of their succeeding; and also on the most dry and exposed situations, in order to increase moisture and obtain shelter; not as being places where

* The woods, copses and commons of this county, are nurseries for thieves. The security which they apparently hold out against detection, has tempted hundreds of the ill-disposed to commence footpads and highwaymen, and has also been the occasion of many murders and robberies being committed, and some of the perpetrators being gibbetted.—*J. M.*

they would invariably arrive at maturity in the least possible time, but as situations where corn and herbage would not succeed so well.

The offering premiums for a general increase of wood, is going retrograde; or contributing towards a retroduction of uncultivated nature; instead of which, *this country ought to be in a state of garden-like cultivation**. *No parts should be in wood, except such as are unfit for the production of grass, corn, and garden crops*; nor would there be, in that case, any deficiency of timber and copse, if the millions of acres of bleak, rocky, steep, and in other respects barren situations, were to be fully planted.

'Planting is capable of doing great mischief to a country, when applied to lands that ought to produce corn and herbage for the use of men and animals. No ground should be planted which is capable of being employed in the purposes of agriculture.'—*(M. R.)*

HEDGE-ROW TIMBER.

Many of the hedge-rows of *this* county are disfigured by pollard trees; but in no degree equal to what they are in some *other* counties. I never saw hedge-rows in any district so barbarously used by the tenants, or that reflect so much want of attention on the part of the landlords, as I have met with in some parts of Suffolk. Nu-

* 'In many parts of North America, the landlord would be much obliged to any body who would carry away the greater part of his large trees. In some parts of the Highlands of Scotland, the bark is the only part of the wood, which, for want of roads and water-carriage, can be sent to market. The timber is left to rot upon the ground.'—*Smith's Wealth of Nations.*

merous

re the fields in that county, whose hedges are
h pollards of every age, under perhaps two hun-
rs, of no value to the tenant, and worth to the
only a twentieth, or thirtieth, part of what those
trees would have been worth, had they been
l from the spoliation of the farmer's axe.
; interest on the value of such trees, the
would have been at least an hundred times more
.

ces are not wanting in every county, of pollard-
nding in hedge-rows; which, if they had been
l till grown into trees, and sold in their prime,
; interest on their produce, would now have
three times more money than the freehold would
hich produced them. But, from want of such
n, they at present disfigure the estates on which
d; and are only of a comparatively trifling value.
ntly, the owners of such estates have lost the
art of their property by the knavery of their
the want of skill and diligence in their agents,
tention or discernment in themselves.

st remedy for this evil would be, for every land-
it down all the pollards over the whole extent of
rty, and to sell them for what they will fetch.
uld produce, on some estates, a considerable
ich, at compound interest, would double itself
rteen or fifteen years. But the longer the pol-
d, the less valuable they will be. In the next
ovenant should be entered into by the tenant,
any tree (nor to *lop* it to any greater height than
n, or twenty feet from the ground) under a
f *five pounds* for each offence; *which* sum the
would be entitled to receive of the tenant for
lard discoverable at any time on his estate. Any
tree

tree recently pollarded, would be evidence against the tenant; who should be invariably required to pay the penalty: and, when that is done, one of the parties should cut the pollard down. If this method were adopted, and the young trees thus carefully protected, the estates would increase in beauty and value every year.

In a *national* point of view, this matter is of still greater importance. It is not conceivable, without the help of calculation, what an immense quantity of timber has been destroyed by the occupiers of land cutting the tops off the young timber plants. If this had been prevented, by a general law, I do not hesitate to pronounce, that no alarm would ever have taken place in this island, as to the want of timber for every purpose.

It would still be wise, and politic, for the Legislature to pass an Act for the effectually preventing farmers and others from cutting off the tops of timber trees, and plants likely to become timber. This regulation, in a century or two, would be the means of producing ten times more timber than ever will be done by rewards for making plantations and woods. It would not only put wealth into the pockets of the land-owners in every part of the island, but would also be the most certain and efficient means of providing an ample supply of materials for the future support of our *wooden walls*, the *best bulwarks* of the nation. It would not be an easy matter to make *an accurate estimate* of the advantages to be derived to this country from such a measure; nor does it seem necessary to go *minutely* into such a statement; but in order to gain a *slight idea* as to the quantity of hedge-row timber, let it be considered that, in well-fenced and cultivated districts, the *hedge-rows occupy* from *a twentieth to a tenth* of the whole surface. Even including the common-fields, and cultivated

cultivated slopes and borders of sheep-downs, the average quantity of land occupied by hedge-rows at this time, amounts to one-twentieth, or two million acres, the greater part of which might be made to produce timber. Trimming the lower branches off the trees to the height of ten, fifteen, or twenty feet, would permit the air to circulate freely, and give every advantage to the crops of the occupier, as well as leave sufficient tops upon the trees for all the purposes of growth and rural ornament. *Under management like this, the hedges would every where present healthy, vigorously-growing, and handsome timber; would add very much to the profit of the land-owner, to the security of the country, and to the pleasures of the traveller.* This would be a striking contrast to the *present* appearance of hedge-rows; which, almost every where, disgust us with the sight of rotten pollards, and trees stripped of their side-branches, like May-poles.

In short, so great is the waste and destruction of timber in the hedge-rows, commons, and forests, of this kingdom, by the conversion of timber trees into pollards, that I cannot sufficiently condemn this barbarous practice.

Although it is evident that trees should be protected against being converted into pollards (worth half-a-crown when they would otherwise become of the value of *5l.*), and generally encouraged in hedge-rows, yet care should be taken to proportion their number to the elevation of the soil, and the size of the enclosure. These being pruned to a proper height, not exceeding twenty feet, might be done in such a manner as to admit the rays of the sun, and a free current of air, to dry the farmer's soil, and ripen his corn.

But to guard against a system of too generally and indiscriminately raising trees in hedge-rows, I need only hint

hint at the mischief which might, by possibility, ensue. Trees with wide spreading branches in hedge-rows, and too many in point of number, are detrimental to corn, by discolouring the sample, decreasing the quantity of grain, and rendering it of unequal size. Closes so circumstanced never produce corn equally ripe, bright, plump, and thin skinned. In winter, the snow becomes drifted under such hedges, where it remains till late in the spring; and then, if the trees go unpruned, they do not permit the sun and wind to dry the ground, and consequently, the husbandman cannot plough and sow land so circumstanced in due season. In summer, the corn in such closes is, perhaps, more liable to mildew, and certainly to the destruction of birds, than in an open country.

In grass, the herbage is much impaired in quality, though the quantity be increased, by such trees and hedges; they are likewise the resort of swarms of insects, which teaze and damage cattle so much, as to render such pastures of less value to a grazier.

WILLOWS, OR OZIERS.

'There are many islands in the river Thames, most of them rented by basket-makers, and planted with oziers for their use. Also, there are several wet borders of small extent, on the side of that river, which are cropped in the same manner.

'I am happy in being able to furnish the Board with the following short, but satisfactory account, containing the specific names of those raised in the neighbourhood of Brentford, the uses to which they are applied, and the manner in which they are cultivated.

'1*st*—The *salix vitallina*, or yellow willow, is cultivated

d chiefly by the nurserymen, and being of a tough yielding nature, is used for binding packages of trees shrubs in the dressing season; and for tying up the ches of wall and espalier trees.

lly—The *salix amygdalina*, or almond-leaved willow, species of which there are several varieties, one of h is called by the planters 'the small rod willow,' or ding rod;' it being chiefly used for binding the ace of garden-grounds. Another kind of this willow present known by the loose appellation of the 'new ;' it is of large growth, and produces a great crop; ed both by the basket-makers and the corn sieve-ers, and is fit for any work which requires a firm as as a tough rod.

lly—The *salix vimenalis*, or ozier-willow.—Of this es there are also several varieties, which are called ng the planters by the name of the 'yellow and brown s,' or, 'COME's oziers.' They are chiefly used by basket-makers, being very pleasant working rods, as they produce a great crop, are much cultivated.

These three descriptions comprehend the most useful ties, and are the most profitable in point of crop, of that are cultivated in this district. There is, how-, a coarse sort of willow, known by the name of 'the iard,' but whether it is a distinct species or not, I mable to decide; it might be rendered extremely l in counties where much brush or underwood is d.

he mode employed in the cultivation of willows is as rs:—The ground is, during the winter, dug a full 's depth, and left rough, to prevent the tides from ng it together again before it can be planted.

he planting work begins in the month of March.

The

The planter having procured the sets or plants, which are fifteen or sixteen inches long, cut diagonally off the strongest shoots of the last year's growth, and care being taken that they are not cut near to the top of the rods, that part being too porous to make a sound plant, the ground is then marked out into rows two feet asunder, and the setts are struck in the rows, eighteen inches from each other, leaving about seven inches of the setts above the ground. This work is very easily done, without using even a dibble or setting-stick; but when planted, care must be taken, by hoeing, to keep them as free from weeds as possible; or, if the ground be too wet for the hoe, a weeding-hook may be used to keep them down: this is absolutely necessary to ensure a good plantation. It is also equally necessary to keep the ground well drained, to prevent the tides remaining upon it any considerable time, for on that also depends the firmness and good quality of the rods.

'The willows are cut the first year with a bill-hook; the shoots are cut off close to the stock, and bound up in bundles, or boults, as they are called, which measure 42 inches round, at 16 inches above the butt ends. The same process of weeding must be pursued every summer, while they are shooting up from the stem. The next cutting season, a portion of them is left to stand another year, where large stuff is wanted, for the ribs of large baskets, &c.

'The planting of willows is expensive the first year; but if well managed, they produce a great profit, as they improve in quantity every year. The profound secresy which every willow-planter observes with respect to his individual profits, renders it impossible to ascertain to what amount this article is cultivated; but greatly profit-

able

able as it certainly is, there are still many parts on the banks of the Thames, well suited to the propagation of this useful plant.

'Oziers are grown on so very small a scale, that it compels the basket-makers to hire suitable land, and plant it for their own use, which occupies their time when they would otherwise be employed in weaving baskets; and every means which they have yet been able to contrive, is insufficient to supply a quarter of their wants. They would willingly pay a high price for oziers grown for their own use; and there is too much land in every county, so neglected in its drainage as to be unfit for every other crop; much land that would be cheaper at 4*l.* under oziers than it is now at 8*s.*; vide Arts and Sciences.'—*The Original Report.*

Willows and poplars, in general, succeed in a loose moist soil; they become stunted in clay. Therefore it is an object with the farmers of the latter, to discover a sort which usually thrives well in strong land. A description is given of a red willow, which is said to be suitable for clay, in the Annals of Agriculture, vol. xxvii. p. 512.

CHAP.

CHAP. XI.

WASTES.

THE several matters usually treated of in this Chapter, are comprised in the following Sections, namely,

COMMONS, ... page 112
ENCLOSING, ... 121
ENFIELD PARISH AND CHASE, ... 134
STANWELL ENCLOSURE, ... 143
SHEEP-DOWNS, ... 144

CHAP. XII.

IMPROVEMENTS.

THE *improvement* of the soil in this county seems to depend on being near London. In the more remote parts, too much of the land lies waste, or in a state of nature; more is in common fields, and, consequently, has only received a slight degree of cultivation; but as we approach the capital, it is mostly in gardens, and therefore in the highest state of improvement.

If

: value of agricultural improvements were, as I think ht to be, estimated by their capacity for giving employ- d support to human beings, it would appear that Mid- so very far short of perfection, in this respect, as to vanced in its course towards it only one-fifth part, and ber county in Britain stands much lower in the scale.* :

ı respect to the question, whether it is better that ements, especially of the more expensive kind, be made by the *landlord* or the *tenant?* the answer think, most readily be found, by first determining an carry them into effect at the least expense. On tates it would, generally, be the *tenant*, inasmuch supposed to live on the spot; and, having every n executed under his immediate inspection, will e be able to keep down the expense as much as . On the contrary, the large proprietor or his generally live at a distance, and therefore cannot it close attendance to the business, which is neces- prevent the expenses from exceeding, in a con- e proportion, those that would arise under the ment and conduct of an intelligent and prudent ying out his *own* money.

much inclined to think that, in case data sufficient

---

le the county into ten equal parts, and the support which they man beings is nearly in the following proportions, namely,

parts supports 5 persons per acre, which I shall call per- on,		5.
itto	2	2.
itto	1	1.
itto	½	0.5
litto	¼	1.25
supports nothing		
rts rather less than one per acre,	or	9¼

not quite one-fifth of what it is capable of doing.—*J. M.*

 could

could be collected to ascertain the fact, it would be found that *tenants* are able to carry into effect improvements at two-thirds of the expense they would cost the *landlords*; besides, the improvement being made by the tenant, gives the landlord the obvious advantage of greater security for the receipt of his rent. Yet there will certainly occur some cases, in which it may be advisable, and proper, for the *landlord* to pay the expense of any improvement that may, and ought, to be made on his estate. As, for instance, where an honest and industrious *tenant* may be willing to pay *interest* for the money expended in making such improvement, but cannot afford to disburse the *original cost*. Humanity says that, in such a case, the tenant ought not to be turned out: the interest of the landlord, and national policy, require that the improvement should take place; it is therefore expedient that the *tenant* should do it, at the *landlord's* expense; the *former* paying four or five per cent. interest on the expenditure of the *latter*, in addition to his former rent: whereby the landlord will not only have the satisfaction of encouraging a spirit of industry, but will also benefit both himself and the public by the improvement of his estate.

On the whole, I am of opinion that *it is advisable to urge the tenants to make the proposed improvement at their own expense; and that the landlords should grant them leases, proportioning the rent, and number of years, to the nature, and supposed expense, of the intended improvement*. This method would, I think, have the merit of rendering complete justice to the interests, and of promoting the advantages of both parties.

But the *landlord* should never forget, that it is *his* business to have the lease darwn up with the most scrupulous attention, and by persons of competent judgment: with particular covenants, that the proposed improvements shall

rtainly be made; that the land shall be put into, ntinued under, the most improved course of hus- ; and that every part of the farm and buildings : surrendered up, at the end of the term, in high on and repair.

SECT. I.—DRAINING.

enclosed grass-land of this county, with very few ons, and those only of small extent, receive this ement by means of surface-drains.

light-land district, from its filtrating nature, is sufficiently dry. *The clayey loams*, that are in ara- e ploughed into ridges and furrows, which lead erfluous rain-water into the water-furrows, provid- that purpose, and it flows from them into the and rivulets. This kind of *surface-drainage* an- erfectly well on the land of this county; as it will, tedly, for any other, except in springy or rotten where another kind of draining will certainly be y*.

gs.—Every spring makes its appearance in a local , and the water may be carried off by means of n drain, made across the rising ground, imme- ıbove the place where the spring shews itself, suf- deep to cut off the supply of water. In this stage

arable land may be effectually drained by ploughing it into furrow; narrowing the ridges as the wetness of the soil in- which renders hollow-drains unnecessary, except in springy at-bogs.'—*Mr. Jenkens.*

of the business *the nature of the soil* must be particularly considered, as the future operations must be entirely regulated by it. Should *it be a loose gravel, or a quicksand*, perhaps a barrel-drain, turned with either brick or stone, the *lower* half laid in mortar, and the *upper* half dry, would be both effective and durable.

In friable loam and more tenacious soil, the drains may be filled with green bushes (not in leaf), or with stones that are free from soil. The wood, or stone, should be covered with a thin layer of wheat, rye, or bean straw; or with the stubble of either of them; or with reeds, weeds, or heath. In either case, the remainder of the trench should be filled up, by *first* placing the more large and loose materials; *next*, the smaller; and *lastly*, the vegetable mould, level with the surface of the adjoining ground.

This method will only require further, a small drain or two to be made to the nearest sufficient fall into a ditch or rivulet, for the purpose of conveying off the water that will be intercepted by, and collected into, the said main drain. The water which collects in such main drain, may frequently be got rid of by boring a few holes in the bottom of it, through the *tenacious* soil into a more *open or porous* one below.

In making hollow-drains (except such as may be made with bricks or stones) in land that has a quick descent, care should be taken that the drains have an easy gentle current; for when they have too quick a fall, they are very apt to become excavated, and lose their support below, in which case they are soon choaked with soil in some places, and are rendered so hollow in others, that a very small pressure from above entirely destroys them.

Bogs.—I have no knowledge of there being any bogs within

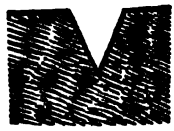
within this county; but, wherever they may be, draining is, unquestionably, the first step to be taken towards *their* improvement. For the accomplishment of which, Mr. ELKINGTON's mode ought to be resorted to, though we should not be too sanguine, or imagine that it is, in every case, an easy operation. I much fear, that there are *some* bogs which could not, without great difficulty, be drained at all; and *others*, that would cost the value of the land, in drains and machinery, to effect it. Yet, notwithstanding some *unsuccessful trials*, we ought not to be discouraged from the attempt, where there is a tolerable prospect of succeeding in it. The cases are no doubt very numerous, in which this sort of land may be effectually drained at an easy expense; and thereby brought from a state of *annoyance*, *to yield considerable profit* to the owners and the community.

After this kind of soil has been completely drained, it should be cultivated as peat-earth. (For a description of this mode of culture, see the article Tillage.)

Clayey Soil.—There are many *dense soils* in grass, which are chilled by the water lying too long on the surface: this defect might be remedied, and the soil rendered tolerably dry, by means of *open* drains only. Drains made in the usual manner, and covered with clayey loam sufficiently thick to support the treading of neat cattle and horses, cannot admit surface-water to percolate into them. But as this objection is entirely obviated by *open* drains, it seems advisable to make *such*, except in *paddocks*, *lawns*, *and the like*, where they would, for obvious reasons, be objectionable. As the drains in *such places* have only the surface-water to carry off, they need not, nor indeed should they, be made deep; but of a triangular shape,

and such a depth only, as to admit of their being nearly filled with willows, or other *green* wood, as to have only a tender loam and turf, of a few inches thick, placed upon the twigs, through which the water would probably percolate. It would do equally well, and be more durable, to cover the bushes with stones to a level with the surface, and leave them in that state; or the drains may be entirely filled from the bottom to the top with stones, and so remain, without any turf over the stones*†.

A common plough might be held so as to *cut, in grass-land, small triangular trenches*, thus: which would be *sufficient to lay every soil of this tenacious kind, tolerably dry.* An objection to this arises from the quantity of soil turned up by the plough, which most persons would either cart off, or spread on the land; though I think it is better to do this work in the summer, burn the turf ploughed out of the drains, and spread the ashes. This, as well as most other methods of draining adhesive grass-land, occasions a small loss of herbage, till it can extend itself over the drains; but that is only for one or two years. After these drains are once made, they may be continued for any length of time, by passing the wheel, hereinafter described, along them annually in November;



* The importance of using *green* wood in drains, is fully ascertained in Mr. HASSELL's Report of Carmarthenshire, page 27; and in the same place he has suggested a very improved method of placing the wood for particular soils.—*J. M.*

† 'Draining meadows with hollow-drains, particularly strong clayey land, has been found a great impediment in dry seasons; and in wet, I have seen the water stand on the drain. The only method by which I could preserve the meadows for a productive crop, is, not to have heavy cattle in them after November. I approve of hollow-draining squally lands.'—*Note in the margin of one of the returned Reports.*

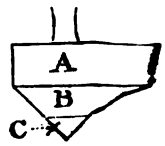
or

r a common narrow wheel on one end of an axle, and a road wheel on the other end, would frequently answer ne same purpose, by loading that side of the cart which s supported by the narrow wheel.

The necessity for draining surface-water from clay soils, n wet seasons, is sufficiently evident; but none of the methods now in general use appear to me to be so simple and effectual for that purpose as might be wished. Covered drains are not only very expensive, but frequently fail to produce the desired effect, in consequence of the covering material being of too close a texture to suffer water to filter through it with sufficient freedom. The best constructed mole-plough requires a team more powerful than most farmers can afford to keep; and the number of horses employed to draw such a plough, do much harm by poaching the land. Open drains made with a spade, are objectionable on many accounts; first, from their being too large, unsightly, and inconvenient to the harvest-carts; next, they are dangerous to full-grown sheep and young lambs; and lastly, from the circumstance of much clay, of a nature very inimical to vegetation, being dug up in making them, which, being spread over the richer surface-soil, does considerable mischief. Covered drains are also liable to the last objection. The method discovered by Mr. ELKINGTON, of well-deserved fame, is not applicable to the conveying a superabundance of surface-water from off a deep clay soil. In consequence of the objections which seemed to me to lie against the several methods here enumerated, I was, some time ago, induced to turn my thoughts to the subject, and at length hit upon the following very simple contrivance, which I have found to answer the purpose on my grass-land.

It consists merely of a trifling addition to the felly of a

common cart-wheel, as represented in the annexed figure.



A, the felly of a six-inch cart-wheel; B, an addition of wood to be put on, round the felly; C, a rim of iron, of a triangular shape, fixed to the wood B.

The cost of this addition is about a guinea.

A wheel of this description put on the axle of a cart, in the usual way, will, of course, rest on the edge of the rim of iron marked C; and, on driving the horses forward, make a small indent in the ground merely by the revolution of it. But in order to make it press down to the depth of six or eight inches, that side of the cart must be loaded with stones, iron ballast, or any other heavy material which happens to be at hand, until the whole of the parts marked B and C, and, if necessary, the part marked A, sink into the soil. It would be as well or better, if the rims B and C were in one piece of cast-iron; the increased weight of it would enable it to cut without the aid of ballast, or with less than usual. The cart should then be drawn along in such a manner, that the cutting-wheel may revolve where the drains are intended to be made. In land that is in ridges and furrows, it will sometimes be necessary to draw the wheel along every furrow. When the land is without ridge and furrow, the wheel must be drawn over it in parallel lines, five or ten yards distant from each other. The wheel on the contrary end of the axle is a common six-inch wheel, supporting only the empty side of the cart, consequently it will not cut the ground.

The advantage of this contrivance is, that it makes an indent in the soil sufficient to carry off the water during that winter, by pressing down the herbage, but without destroying it. In the following spring, these drains will be

nearly grown up, and clothed with grass; consequently, there will be nothing taken from the pasturage by the scythe. It is, perhaps, necessary to observe, that the wheel must be drawn over the ground every year on the approach of winter. With it, and two old horses, one stout boy or man may drain from ten to twenty acres in eight hours.

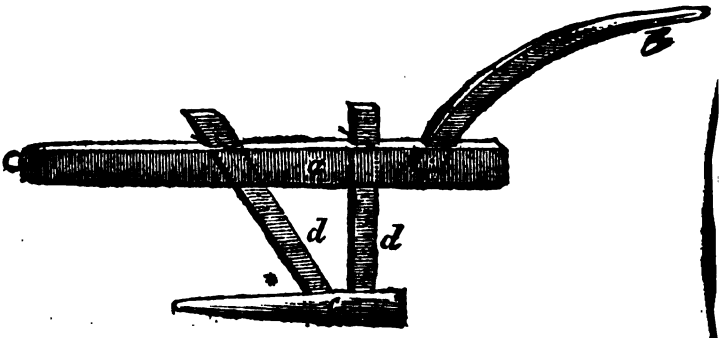
In friable loam the drains should be dug of a triangular shape obliquely across the ground, in such a manner as certainly to intercept and carry off the water; then heath, or green bushes not in leaf, or stones that are free from soil, should be laid in the trenches, and trodden down till the excavation be filled to within about a foot of the surface.

In the winter of 1795-6, I made one of the "Committee of Agriculture," appointed by the Society for the Encouragement of Arts, &c. to inquire into, and examine, the merits and performance of *a mole-plough*, invented by Mr. ADAM SCOTT, for the purpose of making hollow-drains. It appeared to be well calculated for making a drain of *three inches* diameter *(the size* of the borer), at about a foot below the surface, without breaking or turning up the soil; and without requiring any materials to be used in the formation of it, as the whole business was completed by drawing the plough along the place marked out for the intended drain. An idea was entertained, that it would drain *ten or fifteen acres* in a day, at an expense of less than one shilling an acre, even where it might be deemed necessary to make the drains within *five or six yards* of each other. The experiment took place on a clayey soil within Marybone-park; the power was increased to six horses, which broke the tackle; and, after two days trial, it completed about two hundred yards of drain, as perfectly hollow, round, and sound, as a leaden pipe. The sides were so closed, as entirely to shut out the

the filtration of *water*, and therefore *none* oused from the soil (which was wet) into the drain; and, when water was poured over the drain, it could not, generally, penetrate into it, though at some places it certainly did. When the surface was removed, and water was put into the upper end of the drain, it ran through the whole length, and out at the lower end, in the most free and uninterrupted manner. The drain was cut asunder in various places, to admit of observation and inspection. A transverse section of this drain appeared thus:

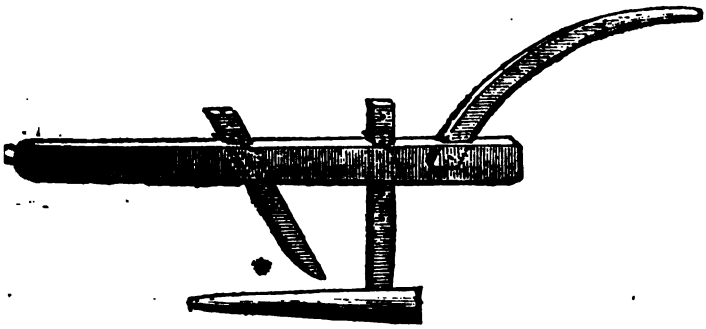
and it seemed to be so closed at top, as to prevent any water passing through the nick or opening above it, which nick was intended to have been about a quarter of an inch wide, and to have remained open.

The mole-plough under review, consisted of a strong ash beam, *a*, with a handle of the usual construction, *b*. The mole, or borer, *c*, was a cast-iron conical share, of about three inches diameter at the largest end; and was annexed to the beam by means of two wrought-iron flat bars, *d d*, with sharp front edges so as to cut the soil. These last passed through the beam, and contained a number of holes, through which pins were put, in order to determine the depth of the intended drain.



It

It was found that the part marked * could not clear itself of bones, sticks, rags, stones, or such like obstructions as it met with; and therefore, in February 1797, another trial was made, with the plough altered as under.



The part marked * was now found to clear itself of every obstruction, and completed several drains, moving with nearly as much speed as any heavy plough usually goes. The soil in this instance was a loam of a medium density, rather approaching to the tender; the power applied was six horses; and the labour appeared to be full as much as they could, or ought, to perform when in constant work.

It is necessary, in using this plough, to guard against the beam's drawing on the ground, which, in a dense soil, was difficult to prevent; it was this pressure of the beam on the ground, which closed the nick made by the coulter, in the experiment made in 1796. But in the *last trial* this was avoided, by keeping the beam six or eight inches above the surface, and consequently the nick remained open.

It

It seems to be an easy matter to construct the mole plough in such a manner, as to have the front end of the beam supported by any two wheels usually employed with a wheel-plough, for the purpose of regulating the depth of the drain; and if it could be so made as to be used with ease on grass-land, without the horses poaching, it might be annually applied with advantage, at the setting in of winter; as it would be the means of keeping the land dry, for one season at least, at a very small expense, and without disfiguring the superstratum of the soil. The drains made by the mole-plough, have lately been found to perform their office during two successive winters.

Commons.—The *drainage* of the commons of this, and indeed of every other county, is totally neglected; and consequently they are, in various places, and particularly during winter, under water. The soil absorbs as much of it as it can contain, and the rest remains on the surface in a stagnant state; which must, manifestly, be injurious to the health of both man and beast. No effectual remedy can be found for this evil, except enclosing such commons.

The two following sketches represent a spade and scoop used in draining.

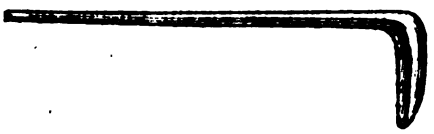
No. 1, draining spade, to dig up the bottom spit.

NO. 1.

No. 2,

No. 2, the scoop, pointed as No. 1, to scoop out the ose mould, &c. at the bottom of the drain, in order to ake it quite clear of all obstructions previous to putting spray-wood, &c.

NO. 2.



The prices of draining on Enfield-chase have been, for

	s.	d.
mmon drains, 20 poles 18 inches deep, each drain,	3	0
incipal drains, 2 feet deep, of the same length,	5	0
urr to each score, ...	0	2

The labourer to find tools, and keep them in repair.

The usual distance at which the drains are made on the ase, is a short pole from each other.

SECT. II.—PARING AND BURNING.

Mr. Foot says, '*paring and burning* has been practised some extent on Enfield-chase, and very productive ops have been obtained by it.'

But the fear (excited by *theoretical* writers on this sub-ct), of exhausting the soil, by such *bulky crops*, induces eople to plough up tough, wiry, benty, and heathy old ard, without paring and burning; to the very great in-ary of the parties. Many there are who fall into this rror; and among the number, were several of the owners of allotments on the chase. As that did not answer, they are

are now very sanguine in their expectation of success from an experiment of *paring only*, and carting the parings off the land into heaps, there to remain until the mass be reduced to mould; when these heaps are to be re-carted, and spread on the land from which they came. This is a laborious, expensive process, that will require three or four years to perfect, even for the smallest piece of land, and much better suited to the *whim* of a man of fortune than to the *pocket* of a farmer.

The impropriety of breaking up this kind of land without paring and burning, is manifested in the neighbourhood of Beach-hill, where land, after twenty years enclosures and cultivation, is in a worse state now than it was originally. Well would it be for the owners of such allotments, if they could now pare and burn it; but it has been ploughed, and not producing more than what the vermin destroyed, laid down in so rough a state to grass, as to be incapable of being pared and burnt. The original wiry bent, and dwarf shrubs, are now growing in full vigour.

On the *enclosure of Stanwell*, in this county, the allotments on Hounslow-heath succeeded well under the perfect practice of paring and burning; and ill, where the turf was ploughed without the application of fire. In the *former* case, the land was immediately fit for turnips, tares, barley and clover: in the *latter*, the tough wiry bent, heath, and dwarf furze, kept the land too light and spungy for any crop. Even rolling cannot keep it down, for its elasticity raises the soil soon after the roller has passed over it, and it is of so imperishable a nature, that it is likely to plague the farmer for many years. The *difference between the two methods of breaking up rough ground, is more than the value of the freehold, in favour of paring and burning, which immediately opens a source of great profit;*

whereas

the other proceeding leads to nothing but expense
ppointment.

ıefore-mentioned are the only *two* instances in this
that have come to my knowledge, and they are
idedly in favour of the fire. In various other
, I have observed the same decided preference
paring and burning. The instances which are
d against it, have arisen from the *rapacity* of the
s; who finding, from the first crops of turnips
ı, that the land was in great heart, have sown
urteen years in succession, till the soil was wholly
:d*. Certain *theoretical reporters* have, in conse-
condemned paring and burning, as "the most
s of all practices," without passing any censure on
ish occupier, and the *negligent* land steward who
:d so infamous a succession of crops. There is no
opriety in thus *generally* condemning paring and
, than there would be in exclaiming against all
imulating manures.

aring and burning has more merit than any other
in its property of converting heath, furze, shrubs,
y bent, into coal, prepared for the food of plants;
'ill pulverize such a soil as much in two years, as
· means can effect in twenty†.

Paring,

---

lated by Mr. GOODCHILD, of Staffordsea, Hants, to Mr. JEN-

ng and burning reduces vegetables and their roots into coal and
. thus prepares both a stimulant and nutriment for plants; it
ys the old sickly roots, and thus leaves room for others, younger
vigorous.'

is an essential ingredient in the food of all vegetables: it is
ll vegetable and animal manures that have undergone putre-
nd is the true basis of their ameliorating powers.'

:d clay and brick-dust, improve the texture of clayey soils, and
o the carbonaceous ingredient.'—*R. Kirwan.*

'The

Paring, burning, and liming at the same time, is the most efficient and cheap dressing that can be given to land on the breaking up of commons and rough pastures, where the natural productions are ling, heath, furze, rushes, and coarse grass. On whatsoever soil they may be found, it never has failed of advancing the land to the first degree of fertility; and he must be a very bad farmer who cannot continue, for any length of time, land so enriched, in a high state of productiveness.

Suppose two or more of each of the crops of turnips, tares, cole and clover, to be raised and fed on the soil, and the land then laid down to grass, without corn, in such case, it cannot be doubted but the herbage would be abundant, and coveted by all sorts of cattle; and its duration, if continued in pasture, would be co-eval with the land.

The particulars brought against this practice, totally fail in proving that paring and burning is in the smallest degree of an impoverishing nature; but they demonstrate the ruinous practice of a succession of corn crops, and the necessity of strong covenants, and a watchful attention, on the part of the landlord, to their due execution, in order to secure the land against being exhausted.

The hills on each side of the meadows which produce the *Newbury peat-ashes*, consist of chalk, easily dissolvable by heavy rain, which washes it off the ridges, down the furrows, ditches, and streamlets, to the low grounds, where mixing with the floods, it is floated over the meadows, and deposited in the peat. Consequently the peat of this district differs from that of most others, by the

---

'The coaly principle may be exhausted by too many crops;' but if these crops are consumed green on the land, the dung and urine of the cattle will increase the carbonaceous principle.—*J. M.*

quantity

ntity of chalk which it contains; and when dug, dried burnt, the fire reduces the chalk to lime, and the rest shes. Hence Newbury ashes are a mixture of lime vegetable ashes, and it is very probable that any com- peat-ashes, or the ashes of rough grass-land, of turf, th, furze, ling, wood, &c. produced by the operation paring and burning, being mixed with chalk-lime in proportion, would be equally fertilizing as these ed ashes.

Paring and burning rough ground in a workmanlike nner, produces *fifty or sixty cart-loads*, of 35 or 40 hels each, or *two thousand bushels* of ashes per acre. is great dressing is procured at the expense of about ty shillings; whereas Newbury peat-ashes, to be laid the land in equal quantity, would cost 50*l.* The quan- of ashes procured by this operation, is forty times ater than the usual dressing of those ashes. It destroys the grubs, worms, and insects, which any farmer uld be glad to get rid of at the expense of the whole ration, at the same moment that it converts rubbish o fertilizing manure. An improver of land should dially embrace a method singular in that admirable cir- nstance, of reducing the wildest, blackest desart, in the ce of a single month, into profitable crops*.

The operation of paring, turns the *sod* upside down, and, en covered with heath, the shrubs keep *it* raised a few

---

A. St. Leger, Esq. says, 'In August 1772, I pared and burnt one three roods of limestone land, and carefully collected the ashes into heaps, for a future experiment. Having so good an opportunity, I sured the ashes, and was much surprized at the quantity, being eighty loads, thirty bushels to the load. I shall not here enter into the its of burn-baking; but, from the above experiment, it is obvious a complete dressing may be obtained, in any country, upon very onable terms.'

inches above the ground, so that it readily dries sufficiently, and is frequently burnt in that state. This is a saving of much trouble and expense, the ashes are thereby more equally spread, and the fire operates over the entire surface of the soil below where the spade went, which is to a greater depth than usual. The following is an instance of the success of a case of that kind.

'The Rev. Mr. Cooke, in the month of April 1792, determined, I understand, to make a course of experiments on a farm which he held in the West Riding of Yorkshire, by burning the sward all over the surface, in the state in which it was left by the paring-spade.—The land was intended to have been ploughed immediately after it was burned; but this was deferred by other business of the farm, for above four weeks, when, to his astonishment, he discovered better than half a plant of spontaneous grass, where nothing but heath and ling had grown before. Agreeably surprized by this unlooked-for circumstance, he suffered it to remain in the state it was; and the grass not only thickened very fast, and grew quite green, but, being the spontaneous produce of the earth, and not arising from seed that had been sown, continued permanent.

'The spontaneous production of this luxuriant grass, he accounts for by the parings being burnt all over the surface instead of in heaps, and never suffering it to burst into flame sufficient to exhale the pabulum existing in the soil.

'The land on which this experiment was tried, is a black peat-earth; the former produce of it heath and ling. The expense of paring and burning he calculates at 16*s* an acre, and the present appearance of the land, he says, affords a reasonable expectation of its being hereafter worth at least 16*s*. an acre per annum.'

'Thos. Bradford, Esq. now of Ashdown-park, near East Grinstead, when he lived near Doncaster some years

so, pared and burnt a poor worn-out ley; spread the ashes, and harrowed in white clover, ray-grass, rib-grass, and trefoil, without any ploughing; and it has ever since been a very fine pasture.'—*Annals of Agriculture*, vol. xxiv. p. 122.

In the month of June 1802, I pared and burnt one perch of rather a poor ley, on a soil of very adhesive loam in several closes; two days after the ashes were spread, I sowed these places with white clover, perennial red clover, nonsuch, and ray-grass. The seeds immediately grew, free from being injured by slugs; and notwithstanding that summer and the following autumn were unusually dry, they soon became an excellent pasture, of a fine deep green, coveted by sheep, who fed the herbage to the very ground. The experiment pieces continued to hold a great superiority over the adjoining pasture during three years; but at the end of that time, they were not discoverable from the rest. These small pieces had produced many times more herbage than the adjoining land, and of a quality vastly more nutritious; but as they were not separated from the rest of the pasture, they did not receive the manure which their rich herbage created. The whole manure was dropt equally over the soil, which accounts for its becoming of a uniform goodness. Being constantly fed by sheep, the whole has become very good; by improving the pasturage, it has become equally so, and not by deteriorating the pared and burnt land, for that is excellent at this time. If the entire pasture had been pared and burnt, it would have received the superior manure made of its luxuriant herbage by fattening sheep. In the year 1803, it was probably capable of supporting five times as much stock as the adjoining land; consequently, it would have received five times as much dressing. This would have been repeated

annually, and that would have been sufficient to support a great superiority over its former state.

Enclosing has been carried on to ten times a greater extent in the *North* of England, than in the *South-east;* and the opportunities of observing their effects, have of course been proportionally many. Most of these new allotments of the commons have been broken up by paring and burning. The few who ploughed their land without this operation, have been much mortified by their own crops not succeeding so well as their neighbours'.

It may be proper to observe, that I am by no means an advocate for the burning of any turf that will readily harrow to pieces; that produces a fine herbage, and which is usually fed bare; nor indeed for ploughing it at all, except its produce be very scanty, and manure scarce; and then only for the purpose of growing and feeding three or four green crops on it, and laying it down to pasture again.

Land, when pared and burnt, yields its treasures very freely: this puts it in the power of tenants, with short leases, to exhaust the soil by successive corn crops; and which may be continued so long as to leave the land a mere *caput mortuum.* But this is occasioned by landlords not granting *longer* leases, making *proper* covenants, and seeing them complied with.

The paring may be thick, which will promote a slow fire; the heaps should be attended, and the fire covered, in order to prevent the emission of flame as much as possible. The turf is usually laid on the heaps with forks, which leave many broken pieces, and some rubbish; these should be raked towards the fires, and shoveled out to them. After the whole are reduced into ashes, the sooner they are spread, the better dressing they will prove;

ve; and, if the soil partakes of the nature of peat, s is a proper time to spread on it lime. The land should w be prepared for cole, turnips, or tares; and these ps should be made to succeed each other, and the ole should be eaten on the same land by sheep.—Vide *tation of Crops.*

Further, I have known much land, worth from 1*s.* to 6*d.* an acre, advanced, by paring and burning, to 10*s.* , and even 30*s.* an acre, on twenty-one years' leases.

Paring, burning, and liming, is equally proper for ck peat-earth, though peat-earth may, in some cases, greatly improved by liming the old turf without break- it up.

NOTES, OR EVIDENCE, IN FAVOUR OF PARING AND BURNING.

Paring and burning is the best method of proceeding in new enclo- s where heath and furze grow, as those seeds cannot be destroyed by d husbandry in any fixed period. A proof, in 1793, of furze-seed being destroyed within a period of seven years' cultivation on new losure where furze grew: some land in South Mims allotment part Enfield-chase, had been cultivated nine years; was apparently very m, sufficient to lay down, which was done in 1792 with clover and grass; after mowing the first crop (1793), there appeared to be ing furze springing up, and on examining, it appeared general. The ing of 1794 it was thought advisable to turn it again to the plough, refore it is most probable no person has been able to ascertain how g a period the seed of furze, by cultivation, can be destroyed. hich observation is very obvious, that paring and burning in that case absolutely necessary.'—*Anonymous.*

'Paring and burning any black, peaty, or heath ground, without me, is a bad practice; the ashes alone would produce two or three erable crops of oats, though no herbage; but with lime, good wheat, s, and grasses.'—*Cardigan*, p. 27.

'Paring and burning is but little used; but when it is, no manage- ent equals it: the farmers on our hills are shy of acknowledging its nefits.'—*Worcester, quarto*, p. 6, *Appendix.*

For instances of great improvements produced by paring and burning, see the Reports of North Yorkshire, p. 55, 109, 113, 114, 115, and 116; Boys's Kent, quarto, p. 38, 45, and 46; East York, p. 37, 39, and 50; and Annals of Agriculture, vol. xxxvii. p. 455 and 456.

'Paring, burning, and chalking, is an excellent method of breaking up wood sour land.'—*Wilts*, p. 94.

'Old worn-out sainfoin-leys, and foul couchy leys of every description, may be cleansed and enriched speedily and effectually, by paring and burning. This operation performed, and the ashes spread, the land is instantly ready for every sort of crop; and the cases are not unfrequent, of sainfoin being thus renovated, without even the operation of the plough and fresh seed.'—Vide *Mr. Marshall's Southern Counties*, vol. ii. p. 32 and 33.

SECT. III.—MANURING.

THE greater part of the manure used in this county is carted from London; being *part* of the sweepings of a surface containing *three thousand acres of pavement, in streets and market-places, and the dung produced by* 30,000 *horses*, 8000 *cows, and* 700,000 *inhabitants.*

The *whole* quantity thus produced is probably not less than *five hundred thousand cart-loads**; about *one-half* of which is supposed to be annually spread on the land of this county. *Unfortunately, ninety-nine parts in every hundred of the soil of privies is carried, by the common sewers, into the*

* This county contains about 179,200 acres. Suppose the produce of 120,000 of these is sent to London; to which add the produce from 30,000 acres in Herts and Essex, and from 100,000 acres in Surrey, Berks, Kent, and all other places, and it will make a total of 250,000 acres, the produce of which is brought to London, and may be supposed to be two loads per acre, which is *half a million cart-loads of produce converted into manure annually*, exclusive of the inside of slaughtered cattle and animals. —*J. M.*

Thames;

*nes; which is a very great loss to agriculture, as night-
not only more quick in its operation than any other dressing,
by far the richest manure that ever was laid on land*.*

he farmers pay at the stables, for a mixture of strawy
and horse-dung, about 2*s.* per cart-load (though
allow their carters 2*s.* 6*d.* a load; the man to get it
eap as he can, which he sometimes does for 18*d.*)
ed so as to contain between seventy and ninety cubi-
eet.

e price of dry street-slop at the dunghills is 1*s.* per
e; the soil of privies, dry, 1*s.* 6*d.* per horse; bones,
boiled, or burnt, and coal-ashes, 6*s.* a load; soot
bushel; horn-shavings from 6*s.* to 7*s.* a sack, of
t bushels, well stuffed; leather dust and shreds 2*s.* 8*d.*
cks of five bushels, well stuffed; the scrapings of
p's-trotters, calves'-feet, cow-heels, 8*s.* a quarter;
len rags from 2*s.* 4*d.* to 3*s.* a hundred weight; and
-hair, if wet, 15*s.* a cart-load.

he foregoing are the prices in London.

he chimney-sweepers who sell *soot* in London, mix
it ashes and earth, sifted very small and fine: this
term '*spicing the soot.*'

he expense of stable litter, when back carriage is reckon-
t any distance to which a team can go six times in every
, is 11*s.* a load, with four horses. But if the farmer
s his team on purpose for manure, which is often the
the expense is 1*l.* 3*s.* per load, with four horses; or
d. less in each case when they do it with three.

e bargemen on the river Thames supply, from the
rent dung wharfs, those cultivators of land who reside

---

hree or four cart-loads are sufficient for the first dressing of an
nd afterwards one load per acre per annum, would keep it perpe-
in heart.—*J. M.*

on the borders of that river, at a much cheaper rate. The manure which they carry consists, generally, of the sweepings of the streets, &c. though it sometimes has a small quantity of stable litter mixed with it.

The street-slop is delivered, at any distance capable of being reached in one tide, at the price of about four guineas for seventeen or eighteen cart-loads; each load consisting of nearly two tons weight: this they call *cold* manure. The same barge being filled with stable litter, they call *hot* manure, and deliver it in like manner at five guineas.

Street-slop is also sent, from the different wharfs, by the river Lea canal, in barges which carry about thirty tons or fifteen cart-loads; and delivered as far as Enfield, which is about thirteen miles, for 4*l.* The price of stable litter or dung is about 20*s.* more.

Chalk is brought by the same canal, from Ware-park, and its environs (Herts) a distance of about eleven miles, and delivered at Enfield, at the rate of 4*l.* for about thirty tons; and is found to answer with tolerable success.

Sheep-folding is resorted to, in order to manure part of the land in different parishes round Hounslow-heath and other commons.

The *gardeners* manure their land *twice* in every three years at least; the *farmers*, in general, only *once* in three or four years. The *former* at the the annual expence of 10*l.* and the *latter* at from 3*l.* to 5*l.* according to the distance of carriage, and the quantity laid on.

The farmers of this county also collect *road-scrapings: mud arising from the cleansing of ponds and ditches; and the top-mould from gravel-pits, &c.*; all of which they lay in the most convenient places for future use: with a part of it they make bottoms for their dunghills. On these bottoms they cart all the dung produced in their respective farmeries,

-meries, and also what they bring from London, or llect from the several inns on the road. When these ls arrive at their intended size, they wisely cover them th road-scrapings, chalk, ashes, builders' rubbish, &c. this state the heap lies till within a month of the time y purpose laying it on the land, when they turn it, d mix the whole as intimately together as possible; king the larger pieces to atoms, and tossing such as too dry, to the inner part. Thus treated, it more rfectly incorporates, and completes its putrefaction ile it continues in the heap, which, as before observed, bout a month, when it is carted and spread on the nd*.

This method of laying *bottoms for dunghills* is a most cellent practice, and cannot be too much recommended the attention of farmers, as it *preserves the fertilizing our which distills from the dung during the heating and refaction which always takes place while it lies in the heap.* he road-scrapings, and other matter with which the mers cover their dunghills, absorb much of the ascend- g vapour, or gas, that would otherwise escape into the mosphere, and be lost. This beneficial practice, how- er, is not universal in this county; as there are *some ughtless men who neglect this precaution; and, consequently, half of the most fertilizing particles, nay, the very essence the dung itself, runs into the adjoining ditches, and is st.*

It is rather a *general* opinion, that the dunghill should

* During the latter end of September, and all the month of October, e farmers cart the dry street-slop on to their grass-land daily as they ing it from London.—*J. M.*

For additional information as to the management of dunghills, see hen-gardens.

be

be quite rotten before it is spread on the land; though, in consequence of all root crops succeeding best on a light soil, it has been the practice of many farmers to use stable litter, hot with putrefaction, and about half reduced, for potatoes and turnips. This is probably right on a soil that is too dense for those crops; but on land that is suitable for them, it is better to let all the parts of the manure become decomposed before it be used. As a general rule, it seems to me to be sound policy, to refrain from using any long dressing till it has undergone such a degree of heat and putrid ferment, as may be sufficient to destroy all the seeds of such weeds, and the eggs of such insects as it may happen to contain. If the farmers were more attentive to this circumstance, their crops would be cleaner than they are, and cost them less money in weeding; and also, that not only their turnips and clover would be less frequently destroyed by the fly, but even their beans and wheat would be less liable to be damaged by vermin.

Many farmers make a point of spreading long manure on their arable land; some of them do so on their grass, and insist that every dunghill produces greater effect when so applied; that is, while it is in a very offensive state. It is capable of being proved, that *dressing the soil with noxious matter, in a volatile state, diluted with water, is the best way of feeding plants.* On that principle it is, that dunghill water, and the putrid water of flax-pits, as well as the Flemish and Chinese methods of applying a prepared stinking liquid, are found to render the soil exceedingly fruitful. It must be confessed, that a dunghill which has been turned once or twice, and remained so long as to become decomposed, has lost much of its offensive smell, and some of its fructifying particles. But it is decided, that

t a dunghill should not be spread on the land before it
undergone such a change as may be sufficient to de-
y the seeds and insects which may happen to be in
This can only be done at a moderate expense, by
heat of a putrid ferment: it must in every case re-
in under such management as is fit for a dunghill,
il their destruction be obtained. If it could the next
ute be carried on to the land, and, while it is hot and
nsive, ploughed in without much waste, it would pro-
ly be applied in that manner to the most advantage,
t the time spent in carriage, spreading and ploughing
the manure, renders that impossible: these operations
ipate all the heat, and much of its goodness, in a state
gas, and puts an entire stop to the putrid ferment;
n which it is not easy to imagine any thing more inju-
us. On the other hand, fermentation in a dunghill
ered by road-scrapings or mould, may be continued till
whole heap become decomposed and cool; in which
nner the volatile particles would be preserved, and
y be applied to the soil.

*The dung of fat animals is unquestionably more rich, and
equently possesses greater powers of fertilization, than the
g of lean ones.* The quality of the dung of every sort
animal will, in a great measure, be proportioned to the
dness or poverty of its food. Thus, when the animal
ed on oily seeds (as lint, rape, &c.) it will be the most
h; when kept on oil-cake (or those seeds deprived of
t of their oil) the next; on turnips, carrots, &c. the
t; on the best hay next; on ordinary hay next; and
straw, perhaps, the poorest of all. *The dung of lean
d-working cattle, feeding on straw, is poor indeed!*

Manure is undoubtedly the great cause of fertility.
e Middlesex farmer says "there is nothing to be done
bout 'mendment.") The soil is grateful, and, for all
the

the dung laid on it, never fails to return the principal with large interest*.

In this county, the produce of the land fetches such a high price at market, that no cattle, by eating the crops either in the field or the home-stalls, would by any means bring so much. This necessarily has the effect of drawing *all* the produce to market, and the land is kept in heart with the dung brought by the carts on their return home. In places at any greater distance from town, *the most effectual way of manuring, is to raise green crops, for the purpose of feeding sheep and bullocks with them on the land.* This is the only method by which the loss of nearly all the urine (which is superior to the dung), and a considerable part of the dung, can be prevented; *for, in the stables, cow-houses, sheds, fold-yards, and dunghills, even under the best management, there is great waste, perhaps of half, including dung and urine. Under ordinary management, three-parts of this manure is lost; but in the soiling of tares, turnips, cole, and clover, in the fields, there is no loss; the whole is immediately applied, without the cost of carriage, to enrich the soil.*

In this county, the grass-land receives most of its manure between the middle of September and the end of October, a time when the sun is not so hot as to exhale its volatile

---

* 'Dung is a proper ingredient in the appropriated manures of all sorts of soils, as it supplies the carbonaceous principle.'—*R. Kirwan.*

'I prepare the bottoms of most of my dunghills with pond mud. After the dung is rotten, I turn the whole over, and mix it in the turning. When mud or mould is not to be had, the yard should have the shape of a dripping-pan with a well in it, and the liquor should be carted out, and showered over the land.'—*Mr. Jenkens.*

'I never turn my dunghills more than once, and think more would be injurious; and always lay mud, mould, ditch-earth, &c. under my dunghills.'—*J. Marsh.*

parts;

ts; and yet a sufficiently early season for the land to r the drawing of loaded carts over it, without being ıched by the horses. The rains which follow, dissolve ;ently into the ground, where it nourishes the grass all : winter, and prepares its roots and buds for growth ly in the spring. *This is supposed, and I think with good son, to be the best season for laying manure on grass-land.*

Contrary to the reasoning of some Correspondents of the ard, it is very well understood in Middlesex, that ma-ring grass-land in the spring is injurious to the future p; therefore it is wisely avoided.

For the most advisable time for manuring arable land, the several crops, such as tares, clover, &c.

Excessive falls of rain powerfully dissolve the animal ng dropt on all land, and they are also too generally fered to wash the dunghills and dung-yards, in every t of this island, which are very frequently laid on slopes, shelving ground, as if for the very purpose of being so shed, and for the dung-water to run off. Thus the ts become dissolved, and such of them as do not per-late into the ground, are floated off, together with e richest mould, along the furrows, drains, ditches, eams, and rivers, towards the sea. Hence the supe-r wisdom of those who take every opportunity of turn-g water thus impregnated, over every possible part of eir land, in such quantity as is best calculated to ensure leposit of its rich contents.

Mr. Kirwan says, 'the water which drains from a trifying dunghill is a good test, in point of colour, of e most fertile soil. Its residuum, after the watery parts ave been evaporated, consist of coal, which is an essen-al ingredient in the food of all plants: it is the true basis f the ameliorating power of all manure.' Dr. Percival s shewn us, that the water which drains from dunghills, contains

contains genuine fixed alkaline salts, nearly in the proportion of one hundred weight of ashes to two wine-pipes and a half of the water*.

For additional observations on manuring with putrid water, see the Section on Watering.

Calcareous Earth—is indispensably necessary to the production of good corn; it gives such stiffness to the straw, as enables it to support itself and the grain. This earth renders the skin of wheat, and other corn, thin, and increases the quantity and goodness of its meal. It promotes the ripening of grain so much, that without it, corn could not be harvested in due time. The farmers who till peat-earth, know to their loss, that the grain which such land yields is the reverse of every good quality; and certain it is, that calcareous earth is the only remedy for so great a defect. All the chalk-downs, limestone-hills, and

* Dr. INGENHOUZ found, that plants possess the power of absorbing the noxious gases which float in the atmosphere, and of rendering it pure and wholesome, which had been vitiated by the breathing of animals, and the burning of fires.

Expensive hand-dressings are in all respects inferior to rotten dung; where that can be obtained, every kind of manure must give place to it.

At the same time that dung affords nourishment, it opens the pores of the earth. Hand-dressings, on the contrary, give food to plants, but contribute little towards loosening the soil. This is an useful and practical distinction, and may be applied through all the variety of manures made use of by the farmer.

The atmosphere is the grand magazine, the great receptacle of putrid vapours, which are constantly exhaled and flying off from the surface of the earth, and from the whole race of vegetables and animals which subsist upon it. These putrid exhalations constitute the true genuine vegetable *pabulum*, or food of plants; therefore, whatever substance of an absorbent nature attracts those principles, more powerfully than the soil it laid on, will to such land be a manure, and infallibly improve the same.

marly

marly soils, in a state of grass, produce herbage which is liked by all sorts of cattle, and they uniformly feed it bare. These soils have another great advantage; they never rot the sheep which graze on them. A bird's-eye view of the uncultivated parts of this island, would discover the calcareous soil clothed with a fine green turf, and the peaty earth of a dingy brown, every where covered with heath. In order to obtain on the soil which bears the heath, as excellent a turf as the other, it is only necessary to bestow on it a proper quantity of a similar earth.

Lime.—There is neither limestone nor chalk in this county; nor is there any lime burnt in it; though there are kilns for the burning of both chalk and limestone at Nine-elms, near Vauxhall, on the Surrey side of the Thames. Chalk-lime may be obtained, in any quantity, at Sutton and Croydon (Surrey), only ten or eleven miles off, *by land*; and at Northfleet (Kent), only twenty miles *by water*; yet it is never used as a manure. The price at which it is sold on the wharfs in London and Westminster, is too high for the farmer; as it would stand him in upwards of 3*l.* a cart-load, by the time he had got it home, if only ten miles from town*.

On enclosing the commons of this county, some cases will present themselves, in which lime would be necessary, and exceedingly beneficial; as it is on all soils that are black and peaty, producing heath.

A close of six acres of land at Shier (Surrey), was dressed, one half of it with farm-yard dung, the other

* It is sold at about 11*s.* per 25 small bushel bags, which weigh about half a ton. A farmer's cart would hold four such parcels. The team and expenses of carriage ten miles into this county, would be 20*s.*; together, upwards of 3*l.*—*J. M.*

with

with lime. Manure, 30 loads on three acres; lime, one kiln, value 9*l.* on the other three acres. First year, wheat, equal; second year, barley, equal; third year, rye for sheep-feed, equal and poor: the sheep fed the rye from the limed three acres wholly off, in preference to the three acres that were dunged. Afterwards, no difference in quantity of produce, but the limed part was rendered more agreeable to sheep. Lime would probably be perfectly proper for any soil producing an herbage which sheep do not readily feed bare; it will render the future herbage more palatable to them, and induce them to feed it.

If lime be laid on with the intent of curing a defect in the soil, it would be useless on land in which there is a mixture of marl, chalk, or limestone; and also on the sand and gravel of marine shells, limestone, marble, or any materials which are reducible to lime; and on any clean-skinned soil, producing a healthy herbage.

Old arable land, that bears good corn, is in no want of lime; nor ought it to be applied to such a soil.

Most kinds of *stone-lime* should be applied with a considerable degree of caution, as the caustic quality is many times greater in *this* than in lime made from chalk. I have had many opportunities of seeing barrenness produced, for a few years, by a too liberal use of it: very generally, at the several places where the carts were stopped for the men to spread it; at the bottoms of every heap; and, once, an entire close*. The last-mentioned mis-

* 'We have had many opportunities of observing the abuse of lime: being too often repeated, and in large quantities, it becomes hurtful.'—*Cumberland, quarto*, p. 50.

These bad effects are also mentioned in the Nottingham Report, p. 105, in which page, the inutility of liming a clay soil is nearly ascertained by experiment. Also vide page 61 in the same Report.

chief

f was done by the use of the noted barrow lime of :estershire, which is much valued by builders for ting a strong cement. The other cases of damage were ısioned by stone-lime, which had a slight tint of a y colour. No instance of injury from the application rhite lime has come to my knowledge.

'he kitchen or market gardeners near London never : their land; they are studious to raise great quantities egetables of the finest quality. Their ground has n dressed with the rotten dung of corn-fed horses, in e quantities for many centuries; notwithstanding that, as no appearance which indicates a want of being reated by lime. These men are so attentive to their insst, that the use of lime cannot escape their thoughts: y are at great expense for manure, and as they do not lime, I am fully persuaded it is unfit for their pure*.

Chalk

It is observed by Mr. SELBY, in the course of some observations he e on this paper, as originally written, 'that it is in a great measure ng to the high price and scarcity of that valuable stimulus to vegeta- (lime), that large quantities of land lie dormant and uncultivated, ıany parts of this kingdom, particularly in the northern counties, re there is an abundance of both limestone and coal. But these ars are frequently so far separated from each other, that it is impos- to convey the coal to burn the limestone into lime, but by shipping. ıis case, the duty at present laid on all coals shipped and sent by sea, high, that it operates as a direct prohibition against the establish- t of lime-kilns. To supply the demand at a moderate price, as it is stonishing preparer of the food of plants, the easy attainment of lime a object of the first importance: it would be a matter worthy of Par- ıent, under the recommendation of the Board of Agriculture, to : off the duty on small, and all inferior sorts of coals, shipped for the pose of being consumed in the burning of limestone into lime. None hese sorts of coals are shipped at present; and, in general, they are ted, and allowed to lie near the pit in heaps. It would increase the

Chalk—that is free, is justly supposed to be the most valuable for a farm; its property of dissolving by rain and frost, enables the husbandman to mix it with his soil. Hard chalk, which resists the operation of the elements to reduce it to powder, would remain in lumps many years; therefore, it should not be spread on any land before it has been either ground to dust, or burned to lime. Chalk which naturally dissolves, that has been ground, or the lime of the latter, are convenient methods of administering calcareous earth to such soils as are improvable by it. The most obvious of these soils are, all such as partake in some degree of the nature of peat, including all those which are capable of bearing heath. Chalk seems to be free from those metallic impregnations, which render the lime from some sorts of stone unfit for manure; but for the builder, it is vastly better for containing a considerable portion of iron, as that enables it to make a much harder and more durable cement. Soft chalk is not to be met with on the face of steep cliffs, such as every where show their rent fronts towards the Weald of Surrey, Sussex, and Kent. These hills were formerly higher and steeper than they are at present; they now consist of little more than the lower, harder, and more stony part of the strata. The original surface was more light, porous, and tender, which readily dissolved, and washed down the gentle slopes of the South Downs towards the sea, where it now lies under the cultivated soil in great abundance, in the state of white marl and fre-

---

revenue, by augmenting the quantity of barley to make into malt, as well for beer as for the distillery: it would be an additional nursery for seamen; and it would employ a great number of men and boys, in gaining an honest livelihood, by labour and industry, which ought to be encouraged as much as possible, in this, and every other kingdom.'

chalk. The same thing has happened on the Surrey and Kent chalk-hills, whose ancient surface incline towards the Thames, in which direction the more tender and dissolvable parts of the chalk have been carried, and near the feet of these slopes, it may now be met with in great plenty *.

Limestone.—In Oxfordshire, Gloucestershire, Wilts, and other counties, the limestone consists wholly of marine matter, or shells, cemented together by animal gluten deposited from the sea. The whole bears conclusive evidence of having accumulated at the bottom of the ocean, and is a mere shell of from two to five or more feet in thickness, lying immediately under the cultivated surface.

In other parts of this Island, marine-limestone has been deposited in strata of great thickness. An inquiry into the origin of all limestone, the manner of its accumulating, particularly into the possibility of much of this stone owing its origin to any other cause than the sea; is a very important subject in the study of geology. Such an investigation would lead to a history of the planet which we inhabit. Thus much is evident, that at some former period of time, this planet has been much less than it is now; that it has acquired its present size in a gradual manner, very slowly, but certainly and incessantly operating to en-

* Query—Whether our chalk-hills were formerly masses of marine limestone, which, in a later period of the world, were reduced to lime by fire? Their appearance at this time is rather favourable to such an opinion. Chalk contains the impressions of marine shells, and I have found cockle-shells imbedded in it. Mr. Jonas Hanway, and others, say, lime is burnt at this time on the western coast of the Caspian Sea, to great perfection, by fire from springs of naphtha, or pure rock oil. The earth round the place, for about two miles, has the surprizing property of taking fire by being merely uncovered.—*J. M.*

large it. The same cause cannot do otherwise than continue to augment the quantity of solid matter: there seems not to be any assignable limit to the size which this and other planets may acquire.

We have lately been instructed by an historical account of metallic stones, which have fallen on the earth from the atmosphere. Some of these have weighed upwards of 20lb. and they are supposed to be occasioned by meteors. The instances, well authenticated, of such stones having fallen, are very numerous; therefore it may be taken for granted, that notwithstanding the present comparatively pure state of the air, the formation of very hard stones takes place in the atmosphere. Are we sure that new planets have not taken place in the immense expanse of nature in a similar way, even in our days? it is very probable, that there was a time, antecedent to the formation of any planet, at least of all such as shine with borrowed light (at present we are but little acquainted with the nature of the sun). In the period when the matter which now composes all the planetary systems in the universe was in a state of the original atoms of matter, the air must then have been vastly more in want of purgation than it is now; and consequently every thing was then in a condition more favourable to the formation of solid bodies. If a globe of fire be now capable of extracting materials from the atmosphere, of which it can form hard stones, how much more was this likely to happen in the original, impure state of the boundless expanse. In that state of things, if a stone of the metallic kind happened to be formed, it could not do otherwise than become the centre of a planet: being once formed, it would roll in endless space, and by the attraction of atoms, continually increase its quantity of matter.

Mr. Foot says, '*marl* is a valuable manure on Enfield-chase,

chase, where it is found in some abundance, and is in very general use. The proportion of calcareous earth it contains is considerable, but differs almost in every pit, and frequently in the same pit. Some of it, when burnt, moulders and falls into lime; whilst the contiguous or adjoining part, bears the kiln, and may be made into brick, but of so incomplete a kind, that, in general, it scales and falls to pieces when exposed to the air. This kind of earth differs in colour, as the quantity of clay, sand, or calcareous earth, happens to predominate. It is somewhat singular, that this earth is, for the most part, discovered at or near the summit of the high grounds, from two to four or five feet below the surface. The stratum immediately above the marl, is of a bright coloured brownish clay, not efferverscing with acids, and containing little or none of the calcareous earth. The stratum below it, is most generally of a strong saponaceous blue clay, partaking nothing of the marly nature. The pits are from two to fourteen feet deep. Many curious petrifactions of shells and fossils have from time to time been found in these pits, at the depth of seven or eight feet from the surface.

'The expense of marling an acre of arable land, is generally as under, namely,

	£.	s.	d.
'Four men, digging and filling 80 cart-loads * at 4*s.* a score, spreading, included, is	0	16	0
'One man and four horses two days, at 12*s.* is	1	4	0
'Thus every expense per acre, is .... £.	2	0	0

'or about six-pence a load, provided the marl be upon the spot, but will vary according to the distance of the cartage. The effect of this manure upon new enclosed grounds is very

* Quere—How many cubical feet does each load contain?—*J. M.*

great. A piece of land, of about eight acres, in the possession of Mr. JAMES, upon being drained and marled, produced the following quantities in succession, per acre:

'1st crop—oats on a good tilth, laid down with clover	5 quarters.
'2d crop—clover, first cutting - - - -	2½ loads.
second ditto - - - -	1 load.
'3d crop—wheat upon clover - - - -	32½ bushels, Winchester measure.
'straw - - - -	3 loads.
'4th crop*—wheat broad-cast - - - -	20 bush. Winch.
straw - - - - -	1½ load.

'A seven acre field, after a crop of winter tares, which were cut occasionally in the spring, was tilthed and laid up in ridges over the winter; in the following spring it was harrowed down, and eighty load an acre of marl carted upon it; this was cropped in the usual season, with barley and clover, and a hand-dressing of night-soil thinly sown on the land at the time the seeds were harrowed in. It produced six quarters of barley an acre the first year, with a proportional quantity of straw; two loads of clover on the first crop of the second year, and an additional load on second crop; the third year it produced twenty-five bushels of wheat and two loads of straw.'

The meadows on the borders of the Thames at Shepperton, abound with good marl.

In the marls of Enfield-chase, Shepperton, and the counties of Herts, Essex, Surrey, and Suffolk, the calcareous matter is chalk, which has much the appearance of being about three-fourths dissolved, leaving only a kind of core, in very small pieces, seldom so large as a cubic inch, which the brick-makers about town call *race*.

For a further account of marl, see Enfield-chase.

* Three crops of corn, and two of clover, in four years, and all carried off, would ruin much better land than the chase.—*J. M.*

I have

I have not heard of there being any *shell marl* near the surface in this county; but, at the depth of many feet a strata of four or five feet in thickness, consisting of oyster, and other marine shells, and sediment, has been dug through at Chelsea, Paddington, and various other places; and it most probably extends over at least all the flat part of the county. The same strata has been met with in many places in the adjoining county of Surrey. I know not whether it has been used as a manure, except indeed in such small quantities as are usually dug on the sinking of wells; nor has any one entertained an idea of raising it purely for the purpose of agriculture. However, if it should be found to answer, I do not see why this should not be done, as the springs are considerably below it, and the expense would not much exceed what is constantly incurred in various parts of Herts, for the procuring of chalk: or it might be raised in the same manner as coal, which in some places is sold as low as two shillings or half a crown a cart-load.

The blue, dense earth, found very generally in the south-west part of the county, at the depth of about eight or ten feet, has been tried by Mr. East, on some of the most gravelly land near Heath-row. It slacked like lime, and, after the first year, he says the improvement was conspicuous, and has continued so for several years. To the farmers of Stanwell, Heath-row, and West Bedfont, this earth is deserving of attention: it should be tried over a very small extent; and, if found to answer, it may become a real treasure to them, and also to the first cultivators of the more gravelly parts of Hounslow-heath.

Clayey-Marl—should not be laid on a strong loam, at least not without its benefits being first clearly established by a sufficient number of experiments, tried for several

years; as it will generally increase the wetness and tenacity of the soil.

At Vinehall, Sussex, several fields of temperate loam were marled about thirty years ago by the present tenant, (SMITH), who complains, that it has done much harm, by rendering the land too tenacious, adhesive, and wet; and likewise, that it introduced *coltsfoot* into the fields; which has maintained itself ever since, in spite of every endeavour of the tenant to eradicate it.

The soil of privies is much superior to every other manure which I have happened to try; it seems to me to be about five times as valuable as rotten horse-dung. Twelve years ago, I stated, that four loads were a proper dressing, in the first instance, for one acre of poor land; and afterwards one or two loads annually applied to each acre, would keep it perpetually in good heart. A farmer who fetches dung seven or eight miles, should by all means purchase this manure; in which his team would bring as much in one, as it has usually done in five days: that is, equivalent to obtaining as much for one guinea as heretofore cost him five. The price of it is on the advance, but that should not deter him from the purchase of it; the saving in carriage is amply sufficient to repay every increase in the original cost.

Dr. WILKINSON, of Enfield, in this county, writes, that 'tallow-chandlers' graves are one of the strongest manures which the animal kingdom can furnish; when laid on grass-land, it should be either spread very thin, broken into small pieces, by means of a mill similar to a tanner's bark-mill, or applied in compost with mould.—It has been used to the amount of a ton an acre, at half a crown the hundred weight; but the grass was thereby rendered so rank, that for some time the cattle would not touch it, and the hay was too coarse for sale; therefore, on

account of its astonishing fertilizing properties, should 'er be used, but mixed with mould, ditch-earth, or urings: its effects are visible for many years after it has n laid on, in the superior verdure of the grass. On being tried for barley, the straw was rendered so ex- mely rank, that it bore scarcely any grain. The most rantageous method of applying it to arable land, has n found after repeated experiments, to be to the turnip p; where it turned out far superior to dung or any ıer manure ever before used; as the turnips were both ge in size, and the tops wonderfully luxuriant.'

Soap-makers' Waste—was tried by me in three grass ses of dissimilar soil ten years ago, without doing either od or harm. Mr. RUSSELL, a soap-maker, tried it to ;reat extent, on clayey land in Kent, with a similar ıult. It may be useful in the glass manufactory, but t so in agriculture.

Wood Ashes—I have tried in various proportions on my ass-land, without the least effect.

Soot.—The soot of all the chimnies in London, and ost of those in other parts of the county, is collected by e sweepers, and sold for the purpose of top-dressing heat and young clover; though I believe more of it is ed in *Hertfordshire* than in *this county*. It is usually read at the rate of forty bushels per acre, towards the tter end of February.

Smoke.—The smoke, consisting of the lightest particles of ot and coal, raised by the force of the ascending current rarefied air arising from three hundred thousand fires London and its environs, is daily deposited on the sur-

rounding

rounding country: the next rain washes it into the soil, where it promotes vegetation.

Lintseed.—1802, May 7th.—I sowed 3½ lb. of ground lintseed-cake on one perch of mown turf or lawn, near my house; it had no effect. The same day I spread 14lb. of ditto on four perches of pasture, the soil a strong loam; this had no effect. At the same time I distributed 21lb. of ditto on four perches of grass-land similar to the last; the benefit hardly visible. And before I quitted the field, I caused 32lb. of ditto to be sown on four perches of the like land; the benefit became just discernible.

Lintseed-Oil—mixed with water, and showered through the nozel of a gardener's common watering-pot over one perch of pasture; the soil an adhesive loam: this was a weak solution, and yet it was injurious to the white clover. At the same time I showered another perch with a larger proportion of oil; this destroyed all the trefoils, and the pasture was worse for it all the summer.

Peat.—There is much of it in the marshes near Uxbridge, on both sides of the canal, but it is not made any use of. It is intersected here and there by beds of flinty gravel, than which there cannot be any thing more convenient for making roads across these boggy grounds.—Query: Whether burning the peat in order to sell the ashes, would be profitable or not to a landlord, as it would destroy the meadows?

The *Newbury ashes* can be brought by the barges to any place in this county adjoining the river Thames, above London, at two guineas and a half per hundred bushels, nine-gallon measure; (*i. e.* one guinea at the place, and one guinea and a half for the freight).

I have

I have tried these ashes on wheat, tares, seeds, and meadows, in various quantities per acre, on my *clayey-soil*, without their producing any sensible effect.

For the effects of peat-ashes, when mixed with lime, and applied as a top-dressing to the lands in Berkshire, see the Section on Paring and Burning.

Salt—is so far useless on arable, pasture, and meadow, that it does not promote the growth of any vgetable which such land produces. Cows lick it up with the herbage, but sheep refuse it, or smell to it, and quit the place.—On experiments, greatly varied, it is decidedly useless for all the purposes of the farmer, with only the exception, that in the stack it moderates heat, preserves the green colour, and improves the hay.

The eating *mushrooms*, *champignons*, and probably other funguses, increase the fertility of land, producing a vigorous vegetation in the spring, which rises early to maturity. When the rest of a close is ready for the scythe, the grass growing on a part that abounds with fungus, has become too bulky; it has been lodged during several weeks, and in consequence of greatness of quantity, and being so long lodged, has acquired a bad smell. But if a whole close were dressed with them, the herbage should be mown before it lodged; in which case it might be made into palatable hay. A second, and perhaps a third crop, might thus be obtained; the whole of such a quality as to be suitable for neat cattle. Cows are fond of the after-grass growing on land dressed by them. I have observed my own to feed such places in preference to the adjoining grass*.

* Mushrooms grow much in rings, which rings are occasioned by the fungus; originally a cluster, afterwards a small circle, which annually enlarges its circumference.—*J. M.*

The

The following Notes are copied from observations m[illegible] in the margins of the Original Report:

'*Coal-ashes.*—I have frequently tried them upon cold, wet, cl[illegible]y meadows, but never found they paid the expense. Upon gravel I [illegible] known them answer well, and the Hertfordshire farmers sow great quantities of them annually, upon their clovers growing upon the hot gravels in the neighbourhood of Watford, &c.'

'The Middlesex farmers, particularly in the parish of Hendon and its environs, manage their compost-heaps the best in the kingdom: they make it as fine as ashes, by which means they are enabled to put it on their land at most times of the year, and the first shower of rain is sure to carry it down to the roots of the grass.'—*Anonymous.*

'Where the dung is drawn by back carriage, the expense should not be estimated high; a good load of dung may be worth in London about 3*s.* 6*d.*; about fourteen loads sufficient for an acre. Night-soil is sold at 5*s.* per load, and is reckoned to go three times as far as dung, in giving fertility to land.'—*Dr. Wilkinson.*

'There is a new kind of manure brought into use within these few years, viz. the soil of the necessary-houses in London, which used to be thrown into pits (particularly in Tothill-fields), and quite wasted. It is now regularly worked up with mould. This may be seen done on a large scale on the north side of the New-road, between Marybone and Paddington. Query—the kind of land, and the quantity in which it is laid on? It appears from various authors, to be the chief manure used from time immemorial in China, and reckoned the most forcible.

'Some notice should, I think, too, be taken of the use of soot and bones from the laystalls in London, which last is, I believe, very little known in other counties except in Hertfordshire. Woollen rags, though got in London, are, I believe, more used in Berkshire, being sent up in barges, than Middlesex.'—*Sir Rich. Sutton.*

Night-soil is, in my opinion, founded on experience, the most powerful and effectual manure, quantity considered, of any now in use.—*J. M.*

SECT.

SECT. IV.—WEEDING.

In one or two parishes in this county, the weeds are :stroyed by an entire summer-fallow every third year; ıd on the *strong loams* in the other parishes, by hoeing, ıd hand-weeding the drilled crops of beans and pease.

On the *sandy loams*, by hoeing the crops of pease, potatoes, ıd turnips. After the pease or tares are off, the land is ughed and harrowed, and the *root*-weeds raked together ıd burnt; which is repeated after the cross-ploughing. ıe land being then free from *root*-weeds, turnips are wn, and the *seed*-weeds are destroyed by twice hand-eing. This process being repeated once in three or four ars, keeps *light* land tolerably clean.

In a dry summer, the trouble and expense of raking, cking, and burning weeds, may frequently be saved, ıd the roots destroyed, by only harrowing them to the rface after every ploughing; and thereby exposing them the sun for a sufficient length of time to kill them; hich is effectually done in a week.

Wherever the vegetable mould is of a sufficient depth admit of *trench*-ploughing, *that* operation, aided by a eavy rolling, will completely destroy *root*-weeds. It is ren more effectual for that purpose, than any greater umber of ploughings, and is an excellent method, where can be done without turning up a *poor subsoil*. Most ardeners and nurserymen know, that trenching land is f great importance for destroying weeds, and preserving he soil moist in the most drying weather of summer.

Thistles might perhaps be destroyed in arable land by a llow, continued during one or two summers; in which oughing and hoeing were so often repeated, as entirely

to

to prevent their vegetating: but a method of eradicating them from grass-land is very much wanted.

SECT. V.—WATERING.

THIS county is very well watered. There is no deficiency in *summer* for the use of *cattle*, though some parts are a little too dry for the *crops* in *that season*; and others are too much flooded in *winter*. Yet notwithstanding these extremes, *irrigation* makes no part of the practice of a *Middlesex farmer*; he suffers *the streams* to glide by, or through his farm, without interruption; and looks on them merely as conveying the surplus-water out of the county. When the *summer's heat* is burning up his crops, his only hope is in an early rain: he never thinks of supplying the deficiency of moisture by art. And when the *winter's flood* o'erspreads his fields, in some cases he bewails his misfortune, but dreams not of embanking his land. If his farm is exhausted, he resorts to the London dunghills, forgetful of the streams that are running through it, loaded with fructifying particles.

The improvement of land by irrigation, is of the very first importance. Wherever the water of this county can be flowed over, and afterwards drained off, *any kind of land*, at pleasure, be *it ever so poor*, it may be laid to grass; and, by the effect of water alone, *raised to the highest pitch of perfection* of which meadow-land is susceptible. This is not only a great improvement, worked without manure, in the *first instance*, but the land will *never* want any, or at least not more than it will meet with in the water. The largeness of the produce of watered-meadow is, at the same time, a fund for the dressing of other land; and

particu-

particularly valuable to every cow-farmer. No other mode has yet procured such early spring grass; and the hay, when mown early, is peculiarly suitable for cows, being soft and succulent. As a *cow-pasture*, no other land would support half so much stock.

The produce of meadow-land in this county, is 10*l.* an acre per annum; of the arable land, in *common fields*, 8*l.**; light land *enclosed*, 13*l.*† Any of the foregoing soils would produce 20*l.* if watered-meadow‡.

The importance of water, as assisting the growth of grass, may be judged of by contemplating the circumstance, that at least *three-fourths* of the weight of *grass* is *water*. This is proved by its losing *so much* on being dried into hay; as *four* tons of *grass* make only *one* of *hay*. If therefore the soil be too dry to afford moisture in this proportion, the crop must necessarily be stunted.

Mr. KIRWAN says, 'Grass and corn, during the time of their growth, absorb about one half of their weight of water each day, if the weather be favourable; and the water they thus pass, nourishes them merely as water; but it contributes still more to their nourishment, when it conveys to them earthy and saline particles, as spring and river waters do.'

For the best method of preparing the land for being watered, see BOSWELL's pamphlet on water-meadows.

In *Hanworth-park*, which contains 600 acres of land,

---

* Wheat, -	12		† Wheat, - -	12	
Beans, -	6		Pease and turnips,	20	
Pease, -	6		Barley, - -	7	
	—		Clover, - -	13	
	24÷3=8*l.*			—	
				52÷4=13*l.*	

‡ Three crops at 1½ load, is 4½ loads, suppose at 4*l.* 4*s.* only, is £.18 18 0

Other feed, - - - - - - - - -	1 2 0
Year's produce, - - - - - -	£.20 0 0

there

there are about 60 acres of water-meadow. I have no knowledge of there being any more in the county. *This* is less perfectly managed, than any that I remember to have seen elsewhere; but, though laid out in an ordinary manner, the beneficial effect is very great. In the *middle of September* 1796, one close of near twenty acres of *this* land was, from six inches to a foot, deep in *after-grass of the most luxuriant growth;* when all the *unwatered* grass in the county was *nearly burnt up.* Another close of forty acres, had supported a mixed stock, of 47 horses and bullocks, for three months, who were all doing very well. On the adjoining land of similar quality, *manured, but not watered,* the cut of the scythe was not grown out*.

About one-third of the land in the county is, *in point of elevation,* capable of being irrigated on as easy terms as any land whatever; the rivulets, ponds, and strong land

* A fine stream runs through this park, capable of irrigating nine-tenths of the whole *with at machinery;* and, *with a power to raise it five feet,* it might successively lay the whole under water. But this stream is applied to the use of the canals in Bushey-park and Hampton-court; and the persons employed to keep it clean, will not suffer it to be obstructed, nor diverted from its course, in the smallest degree; though much of it could be returned into the same channel, after having served the valuable purpose of irrigation. These people enter the park, and drag the rivulet at their pleasure, leaving the earth and weeds which they rake out; and, if there be only a barrow-full of it, they generally leave it in eight or ten lumps, besides trampling and destroying the crops in every direction. It is not this water which is employed in irrigating the sixty acres mentioned in the text, but the water of another stream which the estate has a right to use. These men not only injure the produce of the land through which the water flows, twenty times more than might be, if they were attentive to perform their business well, and avoid doing damage; but, what is still worse, they personally insult the gentleman who occupies this large farm, even while they are trespassing on his grounds, and destroying his crops. In short, he is irritated beyond description, and says 'no regard is paid to *a farmer.*'

for

for the making of reservoirs, *being sufficiently high for that purpose.* The Thames is but a few feet below the surface of the adjoining land; however, as it cannot be dammed so as to turn it into water-carriers, it can therefore only be used on a very small scale, without the help of machinery. The greater part of the level, and low situations, are, unfortunately, in *common fields and common pastures;* and, of course, present an insuperable bar against this, and every other improvement. The *enclosed land* too, in every part of the county, is divided and subdivided into such a great number of small estates, as to circumscribe the possibility of making flowing meadows, *without machinery*, into a very narrow compass, along *the borders of the rivers and streams;* and even *there* by no means generally, as, in *such* situations, the same obstructions would frequently be found to interrrupt the conveying of water from levels sufficiently high.

The Thames, at London, receives, daily, immense quantities of the richest materials; and as far up the river as the tide flows, its water is almost saturated with manure. In every part of its course it contains, in a state of solution, large quantities of the most valuable parts of animal manure, and of calcareous matter, previously dissolved by the rains, and washed by the floods off the rich lands, sheep-downs, and chalk-hills of several counties, whose surplus-water united form the Thames; which still farther enriches itself as it passes along, by the waste of various towns. Being thus loaded with the *cause* of fertility, it ought, as much as possible, to be spread over *poor land* in such a manner as to allow it to filter and deposit its rich contents. This can only be done, to any considerable extent, by enclosing the commons; by providing for irrigation during the division, and by calling in the aid of machinery.

The water of every flood, but especially of the first in autumn, is thickened with the washings of manufactures, of farm-yards, of dunghills, of marl, chalk, and of animal and vegetable matter collected from all the lands on which the rain fell which caused the flood. Such an abundance of rich, floating matter, cannot fail of being highly beneficial to every description of land over which it is possible to throw it in such a manner as to deposit its contents. But of all the waters that ever were used for the fructifying of land, the highly putrid seems to claim the first attention. The ponds, for instance, in which hemp and flax have been rated, powerfully promote vegetation; as has been experienced in Somersetshire (see the Report of that county), since I gave the original hint of its probable value on being showered over grass-land, in the Annals of Agriculture, volume 18. Of course, a cheap and ready method of rendering any considerable pond highly putrid, for the purpose of irrigation, would be a valuable acquisition to the agricultural world.

The higher parts of this county, on account of the tenacity of their nature, are particularly adapted for the waters running into the lower ground, between the hills; where dams should be set up, in order to form a number of large ponds that might be employed in irrigating the land below. Every stream should be stopped, by as many dams as might be necessary, to enable the farmer to turn the surplus-water over his fields.

On such parts as are too flat to admit of this method of making ponds, they should be made by excavating the ground, in situations the most suitable for the double purpose of collecting the water, and of admitting it to be turned over the land. Every pond that can be made by the damming of a stream, would collect large quantities of mud, always fit for immediate application on *arable* land, without

any

any thing else being mixed with it; or on *grass*, after being mixed and turned up with dung. Of such great use are ponds, *as collectors of mud*, that some excellent farmers have a *small one at the lowest corner of every close, for the water to deposit the grosser parts of its rich sediment in.*

There are many ponds in this county already; and in general they are situated on high ground, between the sloping sides of two opposing hills. Such, for instance, are those at Hampstead, at Cannons, and near each of the four lodges in Enfield-chase; at Beach-hill, and Trent-place; and in the common west of Elstree: in short, there are ponds in *almost* of the high grounds in the county, and there might be such on *all*, which could be made extensive reservoirs. The surplus-water of every one of them might be employed in flowing some adjoining land, without machinery.

There is a very great quantity of land in Britain, now in a state of nature, which is capable of being drained and watered in the manner of water-meadows; and the various Reports afford ample proof, that it is not always more necessary to re-shape the ground and burn the rubbish, than to bring the water on in proper quantity, and keep it in a small degree of motion till filtered and drained off again. This being continued for a moderate length of time, so alters the nature of the soil, as to destroy the coarse grass, hassocks, rushes, reeds, heath, furze, and other equally worthless produce, which are gradually succeeded by rich grass in the greatest abundance, equal to the production of the most luxuriant soils*.

Most small streams on the side of slopes may easily be dammed sufficiently to turn them over the adjoining

* See Dr. ANDERSON's very valuable Report of Aberdeenshire, quarto, p. 167, &c.; and Dumbarton Report, quarto, p. 80.

ground; and so may many considerable rivulets, where one person only owns the land on both sides to a considerable extent, as is the case on some large estates. But even should the owner of a few hundred acres, which are bounded by a rivulet, have the good fortune not to be hindered in this matter by a mill, he will have to encounter a hundred other difficulties from his neighbours, who are not convinced of the superior value of his enterprise. Some, perhaps, have a short lease; most are tenants at will, and their landlords will not be at the expense of preparing the ground. Damming the water to the brink, without previous preparation of the neighbouring land, would be injurious to it. One, or all, of these objections, would be more than the most spirited exertions could overcome. *Owing to these difficulties, some of which are not of a remediable nature, not one acre in a hundred that would admit of it, can be watered without machinery.*

A power effectual and cheap, for the raising of water in sufficient quantity to flow about ten acres at a time, would be invaluable*; as nearly all the landed estates in Britain might be wonderfully improved by it. Should the power be acquired, be it to work by horses, wind, water, or steam, innumerable are the uses to which it might be applied. The most obvious, to a farm, are thrashing, winnowing, cutting chaff, raising water for the use of the family and the cattle, the grinding of malt, lintseed, and corn; but, above all, the raising water for irrigation.

Forty acres of good water-meadow will support, in the

* Mr. Boys mentions a wind-pump erected near Deal, at the expense of only thirty guineas, which raises 1600 butts in twenty-four hours This would probably water two acres at once; and possibly, for 100 guineas, the same person could erect machinery to irrigate ten acres at a time.—*J. M.*

greatest

reatest luxuriance, 500 Wiltshire ewes and lambs for six veeks, from the middle of March to the 1st of May, durng which time they will improve one shilling a week, r pay *three pounds fifteen shillings* per acre, at a time of ear when all other farmers are distressed from a want of ood for their stock. In Middlesex, it would still be more aluable, as five pounds worth of hay might be mown off t the first week in May.

The best water-meadow is probably the mark of perfection in the management of a farm. It follows, of course, that every possible exertion of labour, art, and machinery, should be employed to flow as much land as possible.

Mills.—Methods should be taken to reduce the number of river-mills, and to increase the number of tide-mills. The former are always injurious and destructive of land of the richest quality; on the contrary, the latter have a tendency to create it. The situations on the coast, and in creeks, are innumerable, where tide-mills might be erected to answer valuable purposes. The foul water of the tide, on being rendered stagnant, would deposit its rich mud, which would convert the mill-pool into meadow, or cause a continual accretion of manure for dressing the neighbouring land.—*J. M.*

CHAP. XIII.

LIVE STOCK.

IN a country like this, where animal food forms so considerable a part of the sustenance of its inhabitants, and where horses are of so much consequence in every department of business, no subject can well be of more general importance, or more worthy of attention, than that of live stock.

Before I proceed more minutely to discuss this important branch of the rural art, I would premise a few observations; namely, whoever means to attempt any considerable improvement of his live stock, should, first of all, be sure to obtain a proper degree of shelter and shade; in the next place, *if his land be not already of the richest quality, he should set about bringing it to that degree of perfection*; at least, he must drain it completely, and, if possible, make water-meadows, raising the whole to the highest degree of cultivation of which it is capable; *as the live stock will, in some measure, keep pace with the improved state of the land.*

Both reason and experience prove, that vegetables and animals are, in some degree, proportioned to the quality of the land on which they are grown, or reared.

Rich land naturally produces a luxuriant herbage, and such rich food will certainly raise large animals: on the contrary, dwarf plants are generally met with on a poor soil, and the poverty of such food as certainly produces stunted animals. To

ove this, let any one disposed to try the experiment, c. twin lambs at the birth; let him rear one of them in poorest manner, and the other in the richest; he will find that the latter has grown to two or three times weight of the former in the same space of time.

ne of the certain consequences resulting from a general en-re, and improved husbandry, would be a more plentiful ly of nutritious diet for all kinds of animal stock; and the of the various breeds of cattle and sheep, would certainly ase proportionally to the quantity and quality of the vege-s on which they feed. A more powerful argument in ur of a general enclosure cannot perhaps be found.

With respect to the choice of stock, at least in regard size, the farmer should keep in view the nature and lity of the soil; as live stock of every kind, and of all various breeds, should, in point of size, be propor-ed to the quantity and quality of their intended food. *richest grazing land, and the most nourishing artificial s, will certainly pay more in feeding large bullocks, sheep, swine, than it would do in feeding the smaller sizes of the e species; and it is equally obvious, that the smaller breeds l answer better on poor pasture than the larger.*

The preference to be given to any particular breed, of every ies of live stock, should be determined by the principal object breeder has in view. If it be to possess a stock that is posed to become more *early fat with a smaller quantity food*, than another breed, the chief thing to be done to in this object will be, to procure *a male and female pos-ing such quality* in a higher degree of perfection than ers of their species. *Their offspring will certainly possess quality of their parents*, and should not by any means crossed with any other breed but such as have the said alities, if not in a superior, at least in an equal degree ith themselves. And it is worthy of attention, that a

this manner; and at a single house in Battersea (Surrey), stalls have been erected to accommodate 500 at a time. They have a little hay or straw given them once a day, to enable them to chew the cud; they both stand and lie on a framing (a kind of trellis) of wood-work, raised a little above the pavement, and are not allowed straw or any substitute for it for bedding. This beneficial practice is extending itself very much, and is, as well as the feeding of hogs by the same means, a very considerable improvement, and must be of great advantage to the community.

Mr. FOOT says, that 'Mr. ALLEN, of Philpot-bridge, fattens oxen of the Worcestershire breed with oil-cake, &c. and generally gets them to so high a pitch of perfection, as to sell them for 40*l.* an ox.' He further observes, that 'farmers near London, who have fat cattle to send to market, have great advantages; they can, if cattle are wanted, send them to Smithfield at a short notice; and if at any time they are not sold, they can return to their pasture, and not be much the worse for their journey. The distance being so small, they may frequently sell them to the London butchers on their own farms, and by so doing save both time and expense.'

It is said that an ox of a medium size, that is about 50 stone of [illegible] each, or between 80 and 90 stone of [illegible], will eat a ton weight of turnips every week; in half a year, on this food and hay, he will become good beef: in which manner and time, he will have accumulated about 80 stone of meat; whereof the turnips are supposed to yield one stone per week, or 26 stone of beef for 26 tons of turnips, and the hay the other four.

A cow that has had one calf, usually fattens with the least quantity of food; a spayed heifer with the next least.

To

SECT. I.—CATTLE.

Neat Cattle.—This county is not distinguished by any particular breed of neat cattle, as belonging peculiarly to itself; for most of the calves bred here are suckled till they are about ten weeks old, and then sold to the butchers, for the supply of the London and other markets, in the article of veal.

In the pleasure-grounds of gentlemen, the Suffolk, Alderney, Jersey, Guernsey, Welsh, and Scotch breeds, are mostly to be met with. The short-horned breed are almost the only sort kept by cow-keepers for the produce of milk for sale. The farmers in the more distant parts of the county have a mixed breed, consisting of all the foregoing kinds, which are employed by them in *suckling*. This practice is well known to be more profitable than grazing, and less so than the dairy. The latter is pretty nearly excluded from the domestic economy of the farm-houses in this county, as the farmers' wives, for the most part, have neither inclination, industry, nor skill, sufficient for the management of a dairy; and in suckling, the business is performed by men, as the women (even the servants) will not go into a dirty cow-house, and submit to the drudgery of milking, and attending the calves.

The wash of malt distilleries, which had for a considerable time been solely used for the purpose of fattening hogs, has of late years been applied to oxen on a very extensive scale, both in this county and in Surrey*. Mr. LIPTRAP, of Whitechapel, has fattened many beasts in

* This practice was probably copied from the cow-keepers, who had, for ten or fifteen years, bought the said wash for the purpose of fattening their dry cows.—*J. M.*

this

other to recommend this measure, much rather rear and fatten *two oxen*, which, when ready for the butcher's knife, should be together worth 100*l.* than *one ox* that should alone be of the same value. The danger of loss by disease, accidental injury, mismanagement in rearing or feeding, sale to an insolvent butcher, theft, &c. &c. is much less in the former case, than in the latter.

'Beside the imprudence of risking too much on a single life, when we breed great rather than middle-sized oxen, it should not be forgot, that *a* GREAT OX *is less healthy*, than one of the middle size. He exposes a larger surface to baneful influences from without; he carries in himself a weight much more burthensome than that of the small ox, comparatively to the principle of life within them: digestion, the circulation of the blood, and all the interior vital functions, in such an animal, go on with a languor, that may be easily deranged: he is less capable of that exercise which is necessary to the healthful existence of every animated being, according to its particular nature. The fibres of the muscles of such an ox are coarse, which makes him less valuable animal food in proportion to its weight, than that of a smaller ox. His life is, in short, more subject to disease and accidents; and he is, upon his death, *cæteris paribus*, less valuable in proportion to his bulk. It is, in fact, with great oxen, in comparison with small, precisely as with great horses in comparison with galloways and shelties, or as with an Irish giant in comparison with a well built man of five feet eight inches high.

'The very great ox of the family of those which contend for the prize at Smithfield, is less fit for labour, than middle-sized cattle of the same species. It is not for want of force and bulk, but for want of elastic activity, of docility, and their not being of hardiness able to endure a course of toil without loss of vigour or extreme decay in flesh,

flesh, that oxen in general are so much less useful than horses, for working in the cart or the plough. But, the very great ox is, confessedly, much less hardy than those which are of a smaller breed: he is more sluggish and obstinate; he requires much more food, and that of better quality, without being able to do much more work: on ground, in the smallest degree rough and unequal, it would be extreme folly ever to think of employing such an animal in the yoke. The great horse may appear the most shewy in the team, and may, on a particular occasion, make a wonderful effort of strength: but, it is the well-built horse of middle size which the farmer will find to serve him the longest, the best, and on the most moderate feeding, in the works of husbandry; and the galloway and the shettie, as has been already observed, are by much the fittest to endure excessive toil in riding. Just so is it with oxen, in respect to the endurance of hardships and the performance of labour.

'In feeding cattle, it is better to have a herd of middle-sized oxen, than to keep only such as may be fellows of of the great prize-ox, and his competitors. To feed a very large ox, so that he may thrive, you must keep him upon a level field of rich herbage; you must house him in winter; you must nourish him on a due mixture of dry with green and juicy forage; you must at no time neglect him either as to the general care of his person, or as to the times and the nature of his feeding. On the other hand, a smaller ox or cow, will get fat even on coarse ground, and on herbage that is not entirely rich and tender; it is not indispensably necessary that you should house him in winter; he does not require you to pay that delicate attention in catering for him, without which you must not hope the great ox to thrive: there may be perhaps a thousand farmers, and not more, in the kingdom, whose situations and modes of husbandry and dealing, might

might enable them to rear great oxen without constant loss: but there is no farmer in any part of Great Britain or Ireland, whose situation may not enable him, if he have any skill or diligence in his business, to fatten with reasonable profit, cows and oxen of the small or middle size.'

Neat cattle are much disturbed in the hot days of summer by the *gad-fly*, which pierces the skin on their backs with a sharp dart, and deposits one egg in each wound, where the maggots are hatched and nourished, and injure the cattle during the long time of ten or eleven months. To prevent their being so alarmed and injured, the backs of the cattle ought to be washed with an infusion sufficiently nauseous to keep the fly off: for which purpose tar-water showered over them once a week, or washing their backs with it every fortnight during the hot weather, would be effectual.

Cows.—The cows kept for the purpose of supplying the metropolis with milk, are of a large size, with short horns, and known by the name of *Holderness cattle* (from a district of that name in East Yorkshire), though they do not now all come from thence, but from similar stock in that and the neighbouring counties.

Of this breed several oxen, weighing from 130 to 140 stone each (14 lb. to the stone), have lately been slaughtered in the northern part of England: one of them, only five years old, which received no higher food than grass and turnips, weighed upwards of 33 stone per quarter. The heaviest and best short-horned cattle in Britain, are reared on land adjoining the river Tees: they highly deserve to be called the Tees Water cattle.

The dealers in these cattle buy them of the breeders when they are three or four years old, and in calf. They expose them to sale at the fairs and markets in this county; particularly at Islington, where there is a fresh supply from

from the country every Thursday morning, by means of which the London cow-keepers are enabled to keep up their several stocks.

Many cows are likewise bought in the aforesaid counties, in lots of ten or twenty, by private commission, and forwarded to the cow-keepers in and near London. The prices given for them during the last seven years, have been twenty pounds or more.

The Holderness, or Tees Water cows, are supposed to give the largest quantity of milk, and, for that reason, they are preferred by the cow-keepers, as quantity, independent of quality, is their object.

'This breed of cattle were, most probably, first brought from Normandy, where they are the common cattle of that country. The late Sir WILLIAM ST. QUINTIN took great pains to cultivate this breed. He had bulls brought from Normandy to his estate at Lowthorpe, and thereby much improved the breed of short-horned cattle, as he not only gave the use of them up to his own tenants, but to the public in general.

'The calves from large cows grow too fast to get soon fat, and they are coarse in the grain of the meat. The smaller sized cows bring calves that are much more esteemed by the customers of the butcher, for smallness of joints, fineness of fibre, and delicacy of taste.'

It is supposed that this breed yields a greater proportion of lean meat in any given weight of beef, than any other; therefore there is less waste of fat, and the meat goes farther in any family. This is the criterion of serviceable animal food—*the greatest quantity of lean meat in proportion to the fat.* All the agricultural societies should attend to the distinction of promoting an increase of muscle; this would be much more valuable than bestowing premiums for the greatest quantity of fat. Animals which readily become unnecessarily fat, are generally deficient in lean.

There

There would not be much difficulty in changing the object of premiums from fat generally, to such cattle as are not only fat, but have the largest proportion of lean to the fat.

Mr. BAIRD says, 'that round Hackney, Islington, Paddington, and several miles thereabouts, the cow-keepers engross every inch of land they can procure. Some of these men have remarkable large stocks of cows. One of them has, on different farms which he possesses in that neighbourhood, very near one thousand. He is said to have repeatedly had upwards of 990, and at one time 999, but never an entire thousand. The last number of these large cows are worth about 23,000*l.*; their annual produce is about 38*l.* each, or 38,000*l.* The net profit of each cow, will appear hereinafter to be 6*l.*; therefore the owner of a thousand, derives from them an annual income of 6000*l.*

'The cow-keepers breed very few cattle, and those only from favourite cows (which become so merely from their giving much milk), and with very little attention to the choice of their bulls. Even in summer, and when the grass is in the greatest plenty, the cows are regularly fed with grains, which, though the quantity of milk is thereby increased, by no means add to its quality.' The general allowance is forty-five quarters of grains per week (at 1*s.* 10*d.* per quarter) to every twenty-five cows. They are given them twice a day, and they have besides, two meals of turnips and hay. 'Some cow-keepers have tried salt mixed with the grains, more with a view to preserve the grains longer in a sound state, than from any consideration as to the health of their stock, or the improvement of the quality of the milk. It is acknowledged that the cows eat the grains so mixed with greater avidity; but the proprietors not getting an adequate return for their trouble and expense, I do not find that it is now much practised.

number of cows (says Mr. FOOT) kept by the ow-keepers, in the county of Middlesex, amounts 7200; and in the counties of Kent and Surrey to have taken great pains to ascertain these numbers much precision as the nature of the subject is ca- and having collected my information from the places, I have great confidence in the account rly accurate.

MIDDLESEX.	
l-fields, ...	205
tsbridge, ..	
re-road, ...	550
igton, ...	3950
iam-court-	
bridge, ...	
-inn-lane,	
ge-wells,	
on, ...	
a, ...	150
f, ...	205
id, ...	406
ouse, ...	180
.....	70
l-green, ...	200
ey, ...	600
y, ...	160
.....	100
itch, ...	200
ind, ...	
ows, ...	224
	7200

Brought forward,	7200
'KENT.	
'Deptford, ...	681
'Rotherhithe, ...	
'Greenland-dock,	
'New-cross, ...	
'Bermondsey, ...	
'SURREY.	
'Lambeth, ...	619
'South Lambeth,	
'Kennington-bridge, ...	
'Coldharbour, ...	
'Peckham, ...	
'Peckham-rye, ..	
'Newington, ...	
'Camberwell, ...	
'Total, ...	8500

'During the night, the cows are confined in stalls. About three o'clock in the morning each has an half-bushel basket of grains. From four o'clock to half past six they are milked by the (retail) milk-dealers, who contract with the cow-keepers for the milk of a certain number of cows, at 1*l.* 10*d.* for eight quarts*. When the milking is finished, a bushel basket of turnips is given to each cow; and very soon afterwards they have an allotment, in the proportion of one truss to ten cows, of the most grassy and soft meadow-hay which had been the most early mown, and cured of the greenest colour. These several feedings are generally made before eight o'clock in the morning, at which time the cows are turned into the cow-yard†. About twelve o'clock they are again confined to their stalls, and served with the same quantity of grains as they had in the morning. About half past one o'clock in the afternoon, the milking commences in the manner as before described, and continues till near three, when the cows are again served with the same quantity of turnips, and, about an hour afterwards, with the same distribution of hay as before described.

'This mode of feeding generally continues during the turnip season, which is from the month of September to the month of May. During the other months in the year they are fed with grains, cabbages, tares, and the foregoing proportion of rouen, or second cut meadow-hay, and are continued to be fed and milked with the same regularity

* The price varies with the distance, as, close to the town, 1*l.* 10*d.*; at a mile, or a mile and an half, 1*l.* 9*d.*; two or three miles, 1*l.* 8*d.* —*J. M.*

† The ground-work of cow-yards ought to be made of lime-rubbish, chalk, &c. which makes a sound bottom, prevents the cows from poaching the yard, and is easily scraped, and kept clean.—*J. M.*

as before described, until they are turned out to grass, when they continue in the field all night; and even during this season they are frequently fed with grains, which are kept sweet and eatable for a considerable length of time, by being buried in pits made for that purpose. There are about ten bulls to a stock of three hundred cows. The calves are generally sent to Smithfield-market at one, two, or three days old.

Such cows as give an extraordinary quantity of milk, are usually kept five or six, and sometimes even seven years. The whole are ultimately dried, in which state they become fat on their former diet; and lastly, they are sold to the butchers*.

PRODUCE OF COWS, AND CONSUMPTION OF MILK.

From the facts adduced in the preceding article, it appears, that there are about 8500 milch-cows kept for the purpose of supplying the metropolis and it environs with milk, and, according to the information received, the quantity given by each cow, on an average, is *nine quarts* a day, equal to, per annum, 3285 quarts.

The calf takes part of the milk for the first two or three days, during which time it would not be saleable; and there is a falling off for a few days before the cow calves: these occasion a deduction of about eighty-five quarts, leaving the annual saleable produce of each cow 3200 quarts, which, at the present price of twopence

* I remember hearing a cow-keeper say, about the year 1780, that he gave linseed jelly and distillers' wash (as before remarked), as part of the diet of his fattening cows.—*J. M.*

three farthings, amounts to	£. 36	13	4
To which sum add for a calf, at two or three days old, from 25*s.* to 31*s.* 6*d.* the medium is nearly	1	6	8
And it gives the total annual produce per cow	£.38	0	0

which, on 8500 cows, amounts to 317,400*l.* per annum.

EXPENSE OF THEIR FEED.

The cow-keepers feed their cattle very highly, in order to their producing the greatest possible quantity of milk. The expense is nearly as follows:

	£.	s.	d.
Turnips, 7 cwt. or 14 bushels, per week each cow, at 6*d.* is	0	3	6
Brewers' grains, 7 bush. at 5*d.* or more, is	0	3	0
Hay, one truss and a half per week, at 2*s.* 6*d.* is .	0	4	9*
The expense of the diet of a cow, is, per week,	0	10	3†

which

* This may perhaps be deemed a low price to put the hay at, but it will not appear to be so, if we take into the account, that the cow-keepers mow their land two or three times in a season; as their object is to procure the most grassy and soft hay they can. It is also not burthened with market charges.—*J. M.*

† The late Mr. HARPER, of Bankhall, near Liverpool, made the following remark on the produce of a cow, and the expense of keeping her. 'That his cows average nine quarts of milk per day all the year through, which is sold at twopence per quart, with the advantage of selling cream. But then, he says, there is a discount to be made: as, when the summer months come in, there is often a great flow of milk comes out of the country, which reduces the average of both milk and cream, to twopence per quart the year through.

'To 3285 quarts of milk, at twopence per quart, - - -				£.27 7 6
'To the average keep of a cow in grains, &c. for one year, at 4*s.* 6*d.* per week, - - -	£.11	14	0	
'To 160 stone of hay, at eightpence per stone, -	5	6	8	
'To 16 weeks grass, at 3*s.* 6*d.* per week, - - -	2	16	0	
together - - -				19 16 8
'Remains - - - -				£.7 10 10

for interest of stock, losses in cattle, and profit.'

By

ich is equivalent to 26*l.* 13*s.* per annum; and that sum ten from the produce in milk and calf, as before stated, 38*l.* leaves ..... £. 11 7 0

There are several other charges to be sus-						
ined by the cow-keeper, particularly,						
he interest of stock, annually,	£. 1	5	0			
maged and lost cattle, ...	0	7	0			
rses, harness, and waggons, ...	1	15	0			
nt of buildings, ...	0	10	0			
e of servants, ...	1	0	0			
enses at fairs and markets; unreseen expenses, and losses,	0	10	0			
se things amount, per cow, annually, to				5	7	0
ch, taken from the 11*l.* 7*s.* before mentioned, leaves a remainder of the net profit of each cow, about				6	0	0

The consumers pay fourpence halfpenny per quart to retailers. If the latter were to sell the milk pure and adulterated at this price, it would yield them a profit 64*l.* per cent. But, in order to discover the actual profit of the retailers, we must add eightpence for cream, short measure, and the extraneous articles mixed with it, which increases 3*s.*, the usual price of eight quarts, to 3*s.* 4*d.*; and, as it costs them only 1*s.* 10*d.* there remains for labour and profit 100 per cent. Thus the retailer clears 3*l.* 13*s.* 4*d.* by every cow. On the whole, they divide among them the unreasonably large sum of 308,833*l.*; and the sum paid for milk amounts to 626,233*l.*

By this account it appears, that the difference in the profit of a cow at Liverpool or London, is not greater than might be expected. Each account states the produce at nine quarts per day all the year round.—*M.*

When the families of fashion are in London for the winter season, the consumption, and consequent deterioration, of milk, are at the highest. During the summer months, when such families are for the most part in the country, the milk may probably be of rather a better quality. The cream is taken from so much of it as remains unsold, and made into fresh butter for the London markets. The butter-milk is given to the hogs.

The milk is always given in its genuine state to the retail dealers; and, as it is sold to them by the cow-keepers after the rate of twopence three farthings per quart, and is retailed by them at fourpence halfpenny, the profit is surely so large as ought to prevent even the smallest adulteration. But when it is considered how greatly it is reduced *by water*, and impregnated with *worse* ingredients, it is much to be lamented that no method has yet been devised, to put a stop to the many scandalous frauds and impositions in general practice, with regard to this very necessary article of human sustenance.

It is certainly an object well deserving the particular consideration of the Legislature. It cannot be doubted, that many persons would be glad to make some addition to the price now paid for it (high as that price is), provided they could, for such increased price, procure so useful an article in domestic economy perfectly genuine.

Mr. BAIRD says, 'not satisfied with the profit here stated, which, considering the difference of measure, is above 100 per cent. it is a common practice with the retailers of this useful article, to carry the milk first home to their own houses, where it is set up for half a day, when the cream is taken from it, at least all that comes up in that time, and it is then sold for new milk. By which means, what is delivered in the morning is no other than the milk of the preceding afternoon, deprived of the

cream

cream it throws up by standing during that time. By this means a further considerable profit accrues to the retailer, and the milk is rendered less nutritious. It is a matter of surprize, that in the city of London, so long and deservedly famous for the attention and vigilance of its magistrates, in the conduct and regulation of the markets, no notice has hitherto been taken of, or any means adopted to prevent, the abuses so generally and justly complained of in an article, the consumption of which, in London and its environs, is greater than in half the cities of Europe. Milk has always been a favourite part of the food of Britons; and in a great and populous city, it is highly conducive to the health of its inhabitants.—Lacte et carne vivunt—says CÆSAR in his Commentaries.'

Five or six men only are employed in attending near three hundred cows. As one woman cannot milk more than eight or nine cows twice a day, that part of the business would necessarily be attended with considerable expense to the cow-keeper, were it not that the retailer, as before observed, agrees for the produce of a certain number of cows, and takes the labour and expense of milking on himself.

Every cow-house is provided with a milk room (where the milk is measured, and served out by the cow-keeper), and this room is mostly furnished with a pump, to which the retail dealers apply in rotation; not secretly but openly, before any person that may be standing by; from which they pump water into the milk vessels at their discretion. The pump is placed there expressly for that purpose, and it is seldom used for any other. A considerable cow-keeper in Surrey has a pump of this kind, which goes by the name of the *black cow* (from the circumstance of its being painted with that colour); it is said to yield more than all the rest put together.

Where such a pump is not provided for them, things are much worse; for in that case the retailers are not even careful to use *clean* water. Some of them have been seen to dip their pails in a common horse-trough. And, what is still more disgusting, though equally true, one cow-house happens to stand close to the edge of a stream, into which runs much of the dung, and most of the urine, of the cows; and even in this stream, so foully impregnated, they have been observed to dip their milk-pails.

A cow-keeper informs me, that the retail milk-dealers are, for the most part, the refuse of other employments; possessing neither character, decency of manners, nor cleanliness.

No delicate person could possibly drink the milk, were they fully acquainted with the filthy manners of these dealers in it.

The same person suggests, *as a remedy for these abuses, that it would be highly proper for every retail milk-dealer to be obliged to take out an annual license from the magistrates:* which license should be granted only to such as could produce a certificate of good conduct, signed by the cow-keeper, and a certain number of their customers; and also on their being sworn to sell the milk pure and unadulterated.

It has lately been suggested by several writers, that carrying grass into the yards, and giving it to cattle there, is more advisable than permitting them to collect their own food. Where the party can manure half his land annually, or the whole every second year, it may be expected to support such a high degree of exhaustion; but in other cases, the pasture would soon be so much impoverished, as to produce nothing for the owner of it to mow. Meadows which can be flooded by art at any period of summer, would probably admit of having their

produce

produce continually carried off: in all other cases, such a system would, in a short time, ruin the land.

The increased labour and expense of such a practice would also render it unprofitable; one man employed in that manner, with a horse and a cart, could not attend the cattle, and bring in the produce of many acres, though it would cost a grazier in this county, annually, 113*l.*: to which ought to be added, that the manure would be wasted in such a manner, as to lose a large moiety of it; in all which ways 120*l.* would be expended, which is a greater sum than this practice is calculated to repay. The only advantage which it promises is, to avoid the damage done by the treading of cattle; it must be admitted that, in wet seasons and deep grass, this is considerable: but *a few additional acres* would supply a similar quantity of herbage at a less expense; where that cannot be obtained, reducing the number of cattle would have the same effect, and might be done without incurring so great a diminution of profit as the foregoing 120*l.* would certainly be.

One man might mow two acres per week, and cart the grass (eight tons) into the yards, and attend the cattle; that is, equal to the diet of six oxen. Suppose this should be continued fifteen weeks, in that time he would clear thirty acres once, or ten acres three times; therefore, the operations of every man employed in this manner, would be confined to ten acres. The grazier who should adopt this system over 500 acres, would have to engage, if he could find them, 50 such men, and put himself to the great expense of that number of horses and small carts, to be employed only during the short space of summer. It is obvious, that this is one of the closet systems of supporting cattle, which cannot be reduced to practice beyond the extent of a very few acres, and only there, when it

can

can be done without any additional men or horses. If the expense of the men and teams are to be brought into the account, it will be altogether unprofitable. Such an expense would, in this county, amount, in fifteen weeks, to 34*l.* 10*s.*; which, divided by the number of acres (ten), proves the charge to be, on each acre, 3*l.* 9*s.*; or divided by the number of oxen (six), it would be, on each, 5*l.* 15*s.*: add this extra expense to a long list of usual and unavoidable charges, and it will swell the account to such a sum, as would exceed the value of the improvement of any cattle whatever.

Many Calves are suckled in this county; they are kept in pens of seven or eight feet square. There are seldom more than four calves in one pen, which has only one door, and that is towards the cows: particular care is taken to keep these places free from dirt of every kind, and well bedded with clean straw. On one side of every pen is placed a small trough, at such a height as to prevent its receiving any soil; that is always kept supplied with chalk, both in lumps and in powder; not with a view to render their veal white, as some persons erroneously suppose, but with the intention of preventing acidity in the stomach. Without this precaution, they would be liable to scour; that would always prevent their thriving, and sometimes occasion the death of the animal. Some persons mix ground barley with the chalk, and others give them daily a ball, or two, or three, made of lintseed-jelly and barley-meal, in order to render them more fat, and in less time than could be done with milk alone. They are suckled at precisely the same time every twelve hours, generally at six o'clock; any considerable deviation in time, would occasion their being fretful, and that would impede their becoming fat. In this manner they are kept, and in about ten weeks they make the best veal:

they

always heavily salted, and very frequently tastes smoaky, fishy, and tallowy; though sometimes perhaps one tub in fifty of it is good.

These three last sorts are mostly consumed by the paupers in the work-houses, &c. and by the servants of the lower order of tradesmen; as the common labourers, even the very lowest classes, will scarcely buy any but the best.

As the manufacturing this article is so limited in this county, that almost the whole consumption is supplied from elsewhere, I shall refer the reader to the Reports of such counties for information, as to the minutiæ of the business, and the various methods in use among the different dairy-women in those districts, where, no doubt, he will meet with ample information as to all these particulars. I shall, however, just state a few general observations which occur to me on the subject.

It is absolutely necessary, in order to procure good and sweet butter, that all the vessels made use of in the process should be daily scalded; the milk should be completely separated from the butter; and the quantity of salt should be proportioned to the length of time it is intended to be kept.

Though, when butter is found to be too salt (as Irish butter very frequently is), it may be deprived of the superabundant quantity of salt by washing it repeatedly in clear cold water, and kneading it with what the dealers call patts. Thus, if well-made butter was, in the first instance, sufficiently salted, it might be exported from this country to Russia; and when arrived there, converted into good fresh butter, by the simple operation just mentioned.

In case the milk should have acquired an unpleasant taste, from any thing the cows may have fed on, this may be corrected by mixing a small quantity of nitre in the milk.

Every

Every dairy, whether appropriated to the making of cheese or butter, should be furnished with a thermometer, and the dairy kept, as nearly as may be, of an equal temperature. To this if cleanliness be added (an indispensable quality), and a proper attention paid to separating the butter from the milk, there cannot be much doubt of the butter being good.

An opinion, I believe, pretty generally prevails in London, that the dealers adulterate the butter (by mixing with it hog's-lard and other ingredients) after it comes into their hands. This is certainly an unwarranted suspicion, which has no foundation in fact. It is well known, that butter in general is so various in its shades of colour, as that no two sorts could be so intimately mixed as to elude detection; and as to their mixing hog's-lard, &c. with butter, it is evident that, at the price that article now fetches, it would not pay for the labour and expense of doing it. Besides, the dealers constantly keep the fresh butter in the very flats or baskets in which it is brought to London, and only take it from thence as it is wanted; so that their customers have an opportunity of observing the state of it, as it comes into their hands, which is of itself a sufficient refutation of the charge above alluded to.

The variegated colour sometimes to be observed in butter, and which may perhaps in a great measure cause the suspicion of its being mixed with some extraneous matter, arises, for the most part, from the want of due care and attention in the dairy-maid, who has not, in that case, completely divested the butter of the milk. It is sometimes to be observed, that in one tub the butter will be in layers of two or three different shades of colour, which, it is well known, arises from its being composed of so many separate churnings.

The following account of the method of making butter in

in Holland, is copied from a manuscript sent to the Board by R. POLE CAREW, Esq.

'The method of making butter in Holland is this—having milked the cow, the milk is not put into the pans till the milk is quite cold; it is then stirred two or three times a day, with a wooden spoon, to prevent the cream from separating from the milk; and if it can be stirred till the spoon will almost stand in it, they deem it so much the better. When it is found to be sufficiently thick, it is put into the churn and beat for an hour. When the butter begins to form, a pint, or more, of cold water, according to the quantity of the milk, is poured in, to separate the butter from the butter-milk. When the butter is taken out of the churn, it is washed and kneaded till the last water is *perfectly clear* and free from milk. By this method, a greater quantity of butter is made from an equal quantity of milk; and the butter is more firm and sweet, and will keep longer, than that which is made by the method commonly in use in England; and the butter-milk which remains is thought preferable.'

Animals not Natives of Great Britain.—Mr. BAIRD says, 'The variety of birds and beasts to be met with at Earl's-court (the villa of the celebrated Mr. JOHN HUNTER), is matter of great entertainment*. In the same ground you are surprized to find so many living animals, in one herd, from the most opposite parts of the habitable globe. Buffaloes†, rams and sheep from Turkey, and a shawl goat from

* Soon after Mr. BAIRD wrote this account, Mr. HUNTER died.

† 'The American buffalo, from the banks of the Ohio, is not only much stronger than the American ox, but also steps much quicker, and the

from the East Indies, are among the most remarkable of those that meet the eye; and as they feed together in the greatest harmony, it is natural to inquire, what means are taken to make them so familiar, and well acquainted with each other. Mr. HUNTER told me, that when he has a stranger to introduce, he does it by ordering the whole herd to be taken to a strange place, either a field, an empty stable, or any other large out-house, with which they are all alike unaccustomed. The strangeness of the place so totally engages their attention, as to prevent them from running at, and fighting with, the new comer, as they most probably would do in their own field (in regard to which, they entertain very high notions of their exclusive right of property), and here they are confined for some hours, till they appear reconciled to the stranger, who is then turned out with his new friends, and is generally afterwards well treated. The shawl goat was not, however, so easily reconciled to his future companions: he attacked them, instead of waiting to be attacked; fought several battles, and at present appears master of the field.

'It is from the *down* that grows under the coarse hair of this species of goat, that the fine India shawls are manufactured. This beautiful as well as useful animal, was brought over only last June from Bombay, in the Duke of Montrose Indiaman, Captain DORIN. The female unfortunately died. It was very obligingly presented by

---

the beef is much superior, as appears from a letter from my learned correspondent Judge TURNER, which I lately communicated to our Bath and West of England Society; an extract from which will probably appear in our next volume.

'Might not these powerful animals, imported from America when young, and trained to the yoke or draught, prove not only superior, but far more economical than horses?'—*Anonymous.*

the

ie Directors to Sir JOHN SINCLAIR, the President of ie British Wool Society. It is proposed, under Mr. [UNTER's care, to try some experiment with it in Eng-nd, by crossing it with other breeds of the goat species, efore it is sent to the north*.

'Mr. HUNTER built his stables half under ground; also aults, in which he keeps his cows, buffaloes and hogs. uch buildings, more especially the arched byres, or cow-ouses, retain a more equal temperature at all times, in gard both to heat and cold, and consequently are cooler summer and warmer in winter; and in situations where ound is so valuable as in the neighbourhood of London, e an excellent contrivance. Mr. HUNTER has his hay-rd over his buffaloes' stables.—The expense of vaulting es not exceed that of building and roofing common cow-ouses; and the vaults have this essential advantage or eference, that they require no repairs.'

'Mr. HUNTER caused his buffaloes to be trained to rk in a cart; at first they were restive, and would even down; but now they are steady, and so tractable, that ey are driven through the streets of London in the aded cart. These animals do not draw greater loads an oxen of the same size and weight.

'This gentleman has at present a very beautiful little ow, from a buffalo and an Alderney. This animal in

* 'Extract of a letter from Bombay, to the Directors, respecting the at, transmitted by Mr. DOMINICUS, of the India-house, to Sir JOHN INCLAIR:—'Your servants at Bussora, contrary to their expectations, ave lately procured and sent to this Presidency (Bombay) two animals at produce the shawl wool. They advise us they are of the best colour, id tolerably hardy. The wool which grows on different parts of their odies under very long hair, is obtained by gently combing them.' A outh America she-goat, it is supposed, is already with kid by him, at [r. HUNTER's.'—*P. Fact.*

some measure is kept for her beauty; and what adds to it, she is always plump and fat, whether in summer or in winter, and upon much less food than would be sufficient to support a beast of the same size, of the ordinary breed. I do not find that she exceeds in quantity of milk, but the quality is very good; and it is certain that she could be fattened at much less expense than any ordinary cow of the same size and weight.'

'Among the experiments now going forward in Middlesex, one of the most important, undoubtedly, is a cross that has been tried between a Spanish ram and two Shetland ewes: four lambs have been already produced from this mixture. The Spanish breed, it is well known, is distinguished for the fineness of its pile, and the Shetland for its softness and colour. If these qualities were united (which, so far as can be judged from the experiment above mentioned, is likely to be the case), the article of wool would be brought to its highest state of perfection.'

SECT. 11.—SHEEP.

THERE is not any particular breed of sheep distinguished from the rest, as exclusively belonging to Middlesex. Indeed the farmers of that county employ their land more profitably, than could be done by breeding and rearing sheep to any greater age than to be slaughtered either as house or grass lamb.

In some of the enclosures of men of fortune, may be found specimens of sheep of various foreign breed mixed with several of this country. This mixture, as an object of curiosity, and from the variety which it gives, affords pleasure to the owners; but is by no means fit for the imitation of a farmer.

The

The ground of the late Mr. ROBINSON, the Surveyor-General, used to be in part stocked with the shorter bodied Scotch sheep, which at a short distance have the appearance of those of the South-down, but the former are inferior to the latter in the essential properties of fine wool, and quietness of disposition. The Scotch sheep have much hair among their wool; they can run like greyhounds, and leap the hedges like hunters.

The farmers of Middlesex buy their sheep at the fairs in Wiltshire, Berkshire, and Hampshire, and of the jobbers of West Country sheep, at Kingston, and fairs within the county. The flocks differ in number, in proportion to the right of common appertaining to the respective farms. The sheep kept on Hounslow-heath, and the adjoining common of Sunbury, were originally from the stock of those counties, but such of them as have bred through several generations, are degenerated into a small unprofitable breed, proportioned to the poverty of their pasture. Certain it is, that the commons of this county, as every where else, are thinly stocked by poor half-starved, ragged coated, and wretched looking sheep.

The same sheep are sometimes kept in this county during succeeding years, only where there are common rights sufficient to support them from the second day of February till the after-grass is ready to receive them.

The greater part of the hay farmers are without common rights, and devote much of their after-grass to the agistment of sheep and neat cattle, which they take in, sheep at *5s.* per score, and bullocks at 1*s.* per head, per week.

Poor pastures are well calculated to produce small, or stunted breeds of sheep, with light fleeces of fine wool, of the value of two shillings and sixpence or three shillings: and, when made fat with high keep, a short fibred mutton; as the rich food of turnips, tares, rape, clover

and sainfoin, is to rear large sheep, with heavy fleeces, producing from seven to ten shillings, and coarse grained mutton.

Animals that are intended to be fattened with the most speed, the least food, and greatest profit, are, or ought to be, kept still, and as free from exercise as possible; as in the suckling of calves and house-lambs, which could not possibly be done with so much increase if they were allowed exercise. This practice applied to sheep, would shew, that for lean stock, much less food is required to support them in any desired condition in a still and quiet enclosure, than is necessary for the same animals if they took much exercise, such as in travelling to and from the fold. All sheep that are reared on commons, as I before observed, are of a rambling disposition, wild, and galloping at the sight of men and dogs; taking so much exercise, wastes their fat, creates a voracious appetite, keeps down the weight of their carcass, is injurious to the wool, and, in hot weather, ruinous to the mutton.

The sheep which are naturally suitable to 'a wild, bleak, unproductive sandy county, abounding with rabbit-warrens,' will be perfectly unfit and improper for the same county after it has been well enclosed; and when, by means of marl and heavy green crops, it is become one of the most fruitful soils in the kingdom*.

Good hedges, closes not large, and plentiful green crops, convey to the mind the idea of a quiet, docile, and perhaps of rather a heavy sheep, as the stock that would be produced under such circumstances.

The mutton of *South-down* sheep is well known to have a finer fibre than that of any other which comes to market; it sells higher in Smithfield than the *Norfolk*, by six-

* This applies particularly to Norfolk.—*J. M.*

pence

pence a stone of eight pounds. and is retailed at a penny per pound above the other. Its superiority is so fully established among the more wealthy families, that the butchers who serve them, look the market over, in order to buy as many of the South-down breed as they know will be required by such of their customers as are willing to pay such a high price for them.

That South-down sheep are a fit and profitable stock for other chalky hills besides those of Sussex, we have the evidence of the practical and enlightened Mr. Boys. See his Report of *Kent*, octavo, pages 132 and 133.

That they endured hard driving and folding in Wiltshire, better than some other breeds, see the Marquis of BATH's experiments, in the Transactions of the Bath Society of Agriculture for the winter 1795-6.

Sheep are particularly fond of ragwort; of course they are proper stock in pastures where it prevails.—*Northumberland*, quarto, page 27.

A great sheep farmer in Surrey confirms what is said in the Rutland Report, that Welsh sheep are not affected by maggots.

Some of the Leicestershire sheep have lately come to Smithfield, which were particularly light in the leg. The same has longer been said of the Kentish, and is always noticed as a defect.

The Lincoln, Leicester, and other long woolled sheep, come to Smithfield in perfection, fresh shorn, in April; sometimes in flannel waistcoats, which are kept on till the sheep are sold, and then taken off by the seller, to be used on other sheep the following week. This seems to be a proper precaution at that season of the year.

At twenty or more miles from London, the dung and urine of sheep is worth about five shillings per head per annum. The animal is injured by the practice of folding

nearly as much, even by a little driving; but if it is to be drove four or five miles daily, as in Wiltshire, and other places, it will be injured to the full value of the manure which it yields.

Driving sheep two or three miles in the morning, from the fold to the pasture; and a counter-march of the same distance in the evening, in addition to being on their legs the whole day, searching for and picking up their food, is such a degree of exercise, as no animal can thrive under. This great labour requires much more food to support the sheep who undergo it, than would be necessary for them in a quiet pasture.

The fold urges sheep to eat too much at one time, and compels them to fast too long at another. In winter they are detained in the fold fourteen hours, or more, nightly, and in summer twelve; either of these periods of time are too long for them to be without food.

By the joint effects of travelling and long fasting, the sheep are considerably injured; this is occasioned by the folding system, which is also very far from making the most of their food.

Sheep left to themselves, feed sometimes early, at other times late, and occasionally during both day and night; in the intervals they lie down and rest. In this manner they repeatedly feed and rest several times every twenty-four hours. This feeding and resting alternately by short intervals, and being free from every degree of disturbance, promotes both their existing, and becoming fat on less food than usual.

It has been said, that 'if flocks were left in stormy weather on extensive plains, heaths and downs, which are not enclosed, and bleak, they might wander many miles from home, consequently in such places, folding is both useful and necessary. There has been instances on the

South-downs, of storms having blown the wattles
, by which the sheep were let out, and driven so
hat their owner did not find the whole of them for
al days. Therefore, says the Writer of this observa-
mere extent of a sheep pasture may be a good reason
olding. To which it may be replied, that such is a
rful reason for enclosing, but a weak one for folding;
gh I admit, that so long as such downs are permitted
tend for ten or twenty miles together without a hedge,
y frequently be advisable to fold on them, especially
e poorer places of them. But I hold, that it is not in
ase necessary to fold sheep on the rich bottoms, or
e land, which lies adjoining, or near, to such downs.
latter is the universal practice, and it is destructive
e landlord's property in the unenclosed grass-land.
fold may generally be prohibited from all arable
, and from all enclosed grass land, except for the oc-
nal purpose of improving a piece of poor pasture.
would banish it to extensive downs, and such like
land, and there it ought only to be permitted, so
as such places continue unenclosed. One hedge, or
round the down which belongs to each farm, would
nt the sheep straying beyond the limits of their
re. But sheep are disposed to sleep too frequently
eir favourite places, and dress their pasture partially;
inconvenience may be partly prevented by a little at-
on on the part of the shepherd; to move them the
hing in the evening to such places as they would
wise neglect. And as this will not in every case be
ient to procure a uniform dressing for the pasture, a
fold may be occasionally had recourse to; or a boy
confine them on such places.

hilly districts of great extent, such as the South and
Country downs, numbers of sheep are pastured in

summer; if they were allowed to lie there at night, the same land would be rendered capable of supporting many more; probably double the present number; and with such management as I shall proceed to detail, even the latter number might be considerably increased.

These downs are all in a state of grass, most of them in sheep pasture; where the turf is clothed with fine herbage, it cannot be applied to a better purpose. But there are many places covered with coarse grass, furze, and stunted shrubs; these ought to be rendered as fine as the best; the most promising way of making them so, is to grub, pare, burn, and sow white clover and suitable grass seeds; or to plough and sow successively root and green crops (without any others), for the support of sheep, on the same land for a few years, and then lay it down for a permanent sheep pasture.

In either of these cases, the sheep should be permitted to remain on this land as well during the night as in the day; and the fold might be used sparingly with advantage, by placing it on the poorer places, in order to advance them to an equality with the better; further, rich bottom land should be made to contribute towards improving the neighbouring sheep downs: this might be effected by contriving to fill the sheep daily in such low situations, and then turn them upon the nearest down. A system of this kind, would be reversing the present practice; but it is so evidently superior, that it is almost needless for me to advise my readers to make the rich land contribute to the improvement of the poor downs. There is no difficulty in growing even successively, if it should be desirable so to do, root and green crops on good arable land, for this purpose; and meadows which can be occasionally flooded by art, afford a never failing supply. If the downs were managed in something like the gene-

rous

rous manner which I have just described, they would treble their present quantity of wool and mutton.

The downs do not differ so much from other grass-land, as to require a system peculiar to themselves. Filling the bellies of lean sheep on pasturage, and emptying them on arable land, is the worst of all mistaken notions; it is ruinous to the man who adopts it, and distressing to the landlord who permits it; consequently the prosperity of the nation is repressed by it, and I believe to a greater extent than any person has yet imagined.

Romney Marsh now supplies London, and other markets, annually, with upwards of 200,000 fat sheep: if those sheep were to be driven on to the neighbouring arable land, and folded there every night, they would never become fat. Such a practice would reduce the rent of that land to below one-fourth of its present amount, and all parties concerned in it would be the worse for it. A similar loss is now suffered by all the downs and other grass-land in this nation, that is used in the same mistaken manner.

The fold is the natural consequence of large tracts of waste and unenclosed land, of a thin population, and of farms being much too large for entire cultivation. Enclose the commons, downs and wastes, reduce the farms and closes to such sizes as admit of entire cultivation, and though sheep-folding would not vanish, it would be reduced to the only cases in which its use can be advantageous.

Enclosed land cultivated in the best manner, does not admit driving sheep daily a mile or more to and from the fold, nor of folding at all to any greater extent than may be necessary for improving a piece of poor grass-land.

Mr. Billingsley warmly contends for the propriety of the

the folding system; but his arguments prove it to be a bad practice, inasmuch as it injures the sheep, by causing the foot-rot to prevail among such flocks as are driven daily to and from the fold. He also assigns this as a reason why more sheep are not kept in the folding districts. And, further, he says, that by the practice of feeding sheep on vetches, clover, and turnips, they are kept free from the above malady. He also admits, that more sheep per acre may be kept by the latter method than the former. (See *Somerset Report*, pages 147 and 257).

'The free use of air, and the disuse of folds, contribute much to the conservation of that fine breed of sheep which constitutes an important part of the opulence of Segovia, in Spain. The Spanish shepherds have constantly perceived a disadvantageous change in the quality of their wool, when they have been obliged, by any particular circumstance, to enclose their flocks in folds.'

'The Tartars of Great Thibet never fold their sheep, the wool of which is beautiful and in high request.'

In a cold climate, during very bad weather, in highly exposed situations, which generally happens for want of enclosure, the fold may be usefully employed in confining sheep within such a narrow compass as mutually to shelter and warm each other. This advantage may be increased by placing close hurdles on the windward side of the fold; but it is apprehended that this should only be done during the most severe weather, and at such a time they should be served with good hay.

A sheep-fold, of fir plates, posts, and quartering, covered with feather-edged deal, close on one side, and at the two extreme ends in pieces which would cover fifteen feet by ten, may be made and placed on four small block-wheels for the expense of 9*s*. per yard; or if painted with tar, it will cost 10*s*. Such a shed would hold as many sheep

as

.t covered yards; the number of them might be increas-
, and placed adjoining to each other in such a manner
to cover a flock of any number of sheep; therefore,
: expense would be 10*s*. each. It would admit of being
ıved by one man; or in lengths of twenty-feet by a
rse. A fold of this kind would last twenty years, or
ıre, which would reduce the annual expense of it to 6*d*.
r head; but allow ten per cent. to include principal and
:erest on its wearing out in that time, and the charge
ı a flock would be 1*s*. per sheep.

The most drying sandy soil is naturally unfit for the
'oduction of wheat. Some persons have said, this defect
ay be considerably removed, over a small extent, by
lding sheep on the newly sown corn. In which case the
ıeration of sowing should be prolonged as much as may
, in order to give time for extending the fold over a
eater quantity of land. Driving the sheep on this land
a dry dusty day, will not settle it so well as their lying
d treading within the fold during the dew of the night.
anuring by the fold is, in every case, out of the question,
that is merely improving one close at the expense of
other.

To which I reply; the defect in a soil which is too
ying and sandy for growing autumnal sown wheat, may
much more effectually helped by sowing the grain under
rrow in February, on one ploughing after turnips fed off,
an by sowing in the dust of autumn, and folding it
ıwn by sheep. This is also particularly suitable for my
vourite rotation of tares, succeeded by turnips fed on
ıe land by cattle, and the latter followed by wheat.

In order to discover the weight of the four quarters of
utton; weigh the sheep alive, in the morning, as being
time when its stomach is less loaded than at other periods
the day: deduct the supposed weight of the wool, and
for

for lean sheep multiply the remainder by the decimal .5
Sheep in good condition, by ..... .55
Sheep that are mutton, by 6
Sheep that are fat mutton, by ..... .65
Sheep in the fattest state that is possible to make them, multiply by 7

In any of the foregoing cases, if the sheep have fasted twelve hours, add .05 to the foregoing decimal multipliers. Then mark off the decimals, and the remainder will be nearly the weight of the four quarters of mutton. That weight, at the price of such mutton at Smithfield market, gives the value of the whole animal.

Sheep that have been reared and constantly pastured on *chalk-hills*, such as the South and West Country downs, are *free from the rot* so long as they are continued in those situations. I have heard the same remarked of salt marshes, and that sheep with diseased livers, brought from rotting ground, heal and become fat in these marshes. *Rotten sheep have in many instances been cured, by feeding on the herbage growing in a thin soil on limestone rock.* Mr. CHAMBERS has known hundreds cured of themselves, on limestone land; their livers healed, and the sheep became healthy.—*Notts*, p. 129.

Sheep were cured of the rot by being wintered on straw in a warm yard, in which there was, probably, sheds to keep them dry. *North York*, quarto, p. 122.

After reading these facts, can any person possibly have a doubt that, on all soils strongly calcareous, and properly drained, sheep will continue sound?

It seems to be highly probable, that the most rotting soil may be cured of that defect, after it is well drained by the addition of a proper quantity of calcareous earth such as either lime, chalk, or marl; and I earnestly recommend this subject to the consideration of the Board

of Agriculture, to gentlemen of landed property, and also to every farmer, as a matter which deserves to be amply experimented.

Since the foregoing passage was written, I have had the very great pleasure of meeting with one proof of it, in the *Staffordshire* Report, quarto, p. 60.

That the rot may be cured by medicine, is also certain. This disease is perhaps rather similar to the dropsy; a preternatural abundance of water. Of six rotten sheep which I had about six years ago, I succeeded in curing five of them; the sixth died full of water. One of the five which were cured, brought me a lamb the following year, which, with its mother, continued healthy, and became fat on grass; the lamb was sold in June, and the ewe in October, to a butcher. The other four also fattened, but in less time on grass alone, and were in like manner parted with. In 1802, on April the 25th, I also drenched two rotten ewes, one of them in the last stage of the disease; they both became sound, acquired fat, and were sold with many others in October to the butcher, undistinguished from the rest. Since that time, I have repeatedly tried the same remedy; and on the whole number of cases, have not lost more than one in six or seven.

The following is the method of performing the cure.

Fast the rotten sheep one night, then take one table spoonful of the oil of turpentine, and two ditto of soft water cold, mix them, and give the mixture to each sheep as one dose. Then keep the sheep on dry food three or four days; at the end of that time repeat the foregoing medicine, and continue them on dry food about three days longer; at the end of that time they may be permitted to join the flock.

Many sheep afflicted with a great degree of looseness, have been cured in the foregoing manner.

Rewards,

Rewards, honours, and titles, are frequently bestowed for things of less consequence to the nation, than making public, an easy and cheap method of preventing or curing the rot in sheep.

'That lime has a powerful effect on animals, is proved in the cases of broken-winded horses which (Mr. WILLIAM BEAN says), receive such relief by drinking lime-water, as to be perfectly fit for all the common purposes of labour, and even to be passed on the best judges for sound horses.'

I am acquainted with a gentleman who had a leprosy on him, which prevented his obtaining any rest. His life became a burthen to him. He was perfectly cured by drinking lime-water. This gentleman informed me of several others who had received great benefit from it in cases somewhat similar.

The *Scab* in sheep is an infectious disease, which is cured in this and the neighbouring counties by the application of a mixture of tobacco-water and oil of turpentine. This is a remedy which puts the sheep to very little inconvenience, and is prepared by simmering one pound of shag tobacco in four quarts of water, until the latter be reduced to three; then wring or press the water out of the tobacco, and add one-fourth part of a pint of the oil of turpentine to each quart of the expressed water; shake them together, cork the bottles tight, and keep them for use. The scab is known by white spots on the wool; the sheep attempting to scratch itself with its hinder feet; nibbling its skin with its teeth, and occasionally pulling off small pieces of wool. The disease may be felt by the finger when only as large as half a pea, but if neglected, it spreads much larger, and generally extends from between the shoulders along the back. The cure is performed by scratching off the top of the scab with the finger, or a toothed

hed iron made for that purpose, and then bathing
rt with the prepared tobacco-water.

: mercurial preparation communicated by Sir JOSEPH
s to the London Society of Arts, has been tried; it
re at one dressing in every case. But it must not
plied in winter; in that season it would kill a large
rtion of the sheep. It is an unsafe dressing after the
: of September; several having died that were dressed
t week of that month, and the first fortnight in
er. It would probably be equally dangerous in the
, before the beginning of April; but from that time
first of September, it has been used with safety.

: application of it, increases the labour of the shep-
in the mildest season it is injurious to health, and in
ful hands it is not without danger. Therefore, it is
visable to give quicksilver the preference to milder
ine; particularly as tobacco-water is more easily ap-
and can be used in every season, without any injury
sheep, and with sufficient certainty of curing the
.

e *Oil* may be safely applied, and it deserves to be
that and cleanliness have been used, and found to
ly eradicate bugs.

: *Foot Rot* is an infectious disease that communicates
eful qualities to the grass; there it comes in contact
he feet of the sound part of the flock, and they
the contagion. Wet weather and long grass soften
t of the sheep, and a continuance of these bring on
l fester, which occasions much lameness; if that
l be neglected, it would rot the hoofs off, and de-
he animal. Many persons have suffered consider-
s by this disease, and by the wrong treatment of it;
er, it may easily be cured in the following manner.
rards evening draw the lame sheep from the flock;

pare

pare the hoof of the diseased foot, as far as it has any dirt or fester under it; wipe it dry and clean, and bathe the tender parts with a solution of green vitriol and verjuice, or vinegar. Repeat this on every foot that is lame; then put the sheep in a building or yard, where their feet may remain clean and dry all night. Bathe the lame feet again the following morning, and keep them dry till the dew be off the grass, and then turn the sheep into a bare pasture, to which the sound part of the flock have no access. In a slight case, they will not want any more dressing, but generally they should be examined, such feet as are in want of it should be rebathed; and if it should be found that the dirt or fester have extended farther than was before discovered, the hollow parts of the hoof must be cut off and the wound bathed. They will daily become more sound, and when perfectly so, may be permitted to rejoin the flock. I found this regimen and medicine effectual in about fifty cases during the summer 1805.

On a former occasion, the wounds were dressed once only, and that in the evening, with a feather previously dipped in butter of antimony; their feet were kept dry through the night, and on the following day they were turned into the hospital pasture, where they daily became better. At the expiration of about a week the lame feet were examined; the greater part of them were well, and turned out, others were healing kindly, and were at the end of another week turned to the flock; about one in ten acquired a little more paring with a knife and a very slight redressing of the sore places only, with the feather prepared as aforesaid.

The latter method is effectual, but it requires more cautious and dextrous management, than is necessary with the vitriolated vinegar.

The following has been handed to me as an excellent dressing

lressing, after the hollow parts of the hoof have been removed; namely, take one pint of verjuice, one-fourth part of a pint of the oil of turpentine, and one ounce by measure of vitriolic spirit; mix these ingredients and bathe the wounds.

Maggots are both injurious and dangerous to sheep; cleanliness is one point towards their prevention, and the rest may be effected by tar water. One flock of 700 were occasionally showered with it during the summer of 1805, and though there was no professed shepherd, they escaped without a broken coat. In this case an 18 gallon cask was placed on one end, and the other knocked out; a few pounds of tar was put in, and the cask successively filled with soft water. Once in twelve or fourteen days the lambs, &c. were showered with this prepared water, through the nozel of a gardener's tin-pot, and that preserved them from the flies*.

'The experiments with Spanish sheep, which have taken place in Middlesex, merit a particular detail in this Report.

'In the summer of 1785, Sir JOSEPH BANKS, Bart. procured from France a ram and an ewe of the true Merine breed, which he kept at Spring-grove, in this county. The flock whence they were selected, had at that time been kept in the province of Burgundy for eight years, without any ram from Spain being brought to it.

'In the year 1787, after having clipped this ram and ewe twice, Sir JOSEPH delivered the four fleeces to Mr. HUMPHRIES, an intelligent manufacturer at Chippenham, who made from them cloth sufficient for a suit of clothes; and this cloth was judged by the trade to be equal in good-

* Some plausible remedies for the diseases of sheep, are mentioned in *Report of Roxburghshire*, p. 159, &c.

ness to superfine broad cloth. In the year 1789, a comparison was made by Mr. BELL, a wool-stapler in Bermondsey-street, between sixteen South-down ewe fleeces, and an equal number of teg fleeces, their progeny by a Spanish ram. He reported that the sixteen South-down ewe fleeces weighed 30½lbs. and, when sorted, worth to the manufacturer 2*l.* 5*s.* 4½*d.*; and that the sixteen teg fleeces weighed 42¾lbs. worth to the manufacturer 3*l.* 11*s.* —value of teg fleeces 1*s.* 7¾*d.* per lb.; of ewes 1*s.* 5¼*d.*; or the tegs 17*l.* 15*s.* per pack, and the ewes only 15*l.* 5*s.*

'Mr. BELL, however, according to the custom of his trade, broke or stapled this wool, which is, not to make any assortment for a higher value than 1*s.* 9½*d.* a pound; but he observed, in breaking the half Spanish fleeces, that a considerable quantity of wool of higher value, was put into that assortment. In the year 1790, sixteen fleeces of South-down sheep, mixed partly half, and partly three-quarters, with Spanish, were put into Mr. BELL's hands, and he was desired to sort them, as is done in Herefordshire, where the dearest class of wool, called "picklock," is estimated at 2*s.* 8*d.* a pound; which he did, and reported as follows: 'sixteen South-down and Spanish fleeces weighed 47lb.; were worth to the manufacturer 4*l.* 12*s.* 10*d.*'—or 1*s.* 11½*d.* per lb.

'In the year 1792, a similar comparison was made by Messrs. BUXTON, the present possessors of the wool-stapling business in Bermondsey-street, late BELL, between twenty fleeces of Nottinghamshire forest ewes, and the same number of their progeny by a Spanish ram belonging to Sir JOSEPH BANKS.

'They reported, that the wool of the twenty original ewes weighed 51lb. and was worth to the manufacturer 3*l.* 10*s.* 10¼*d.*; that the wool of the twenty half-bred Spanish weighed 83lb. and was worth to the manufacturer

6*l.* 7*s.* 11¼*d.*—value of forests 1*s.* 4½*d.* per lb.; of half-bred Spanish 1*s.* 6¼*d.*

'In the year 1793 Sir JOSEPH having made a variety of experiments, all of which tended to prove that Spanish wool had not degenerated in fineness, even on his pasture at Spring-grove, though particularly unfit for sheep, determined to part with his wool, which had been kept for the purpose of comparison from the year 1788; and accordingly he sent the whole collection to Messrs. BUXTON; not expecting to hear any more concerning it, except by receiving a fair price, which he was certain, from the liberality he had observed in the dealings of those gentlemen, would, in due time, be remitted to him: he was, however, agreeably surprised, on the 11th January 1794, by the receipt of a note, of which the following is a copy:

'Messrs. BUXTON present their respectful compliments to Sir JOSEPH BANKS, and beg his acceptance of a piece of cloth produced from three grey Spanish fleeces, weighing together 8lb. and received by them from Sir JOSEPH BANKS. Messrs. BUXTON are informed from Mr. WANSEY (the gentleman from whom they received the cloth in its manufactured state), that it is an excellent piece of cloth; but being made wholly of undyed wool, of its natural colour, the manufacturer is of opinion it will fade in the wear.

'*Bermondsey-street,*
11th Jan. 1794.'

'The cloth appearing to Sir JOSEPH very fine, he, on the 14th of January, forwarded it to Mr. WALLACE, woollen-draper in Bedford-street, a gentleman whose integrity of dealing he had long been accustomed to, with the following note:

'*January* 14*th*, 1794.

'Sir JOSEPH BANKS presents his compliments to Mr. WALLACE, and requests his opinion of the cloth which accompanies this, respecting its value per yard, and its degree of fineness, compared with superfine broad.'

'To this Mr. WALLACE returned, on the 18th, the following answer:

'*Bedford-street, Jan.* 18*th*, 1794.

'SIR,

'I have had the favour of your note, and have examined the cloth you sent for my inspection, very minutely, and find it in every respect very excellent. The wool is remarkably good, though I have cloth, which, in my opinion, is made of rather finer wool, though that may admit of a doubt, as judging from the feel of the cloth, depends much upon the dressing, and cannot be so correct as from the wool itself. The spinning is very fine; and upon the whole, it may, I think, be ranked with the best superfine cloth manufactured in England; if I except a few pieces made at a very high price, and merely out of curiosity. I find it stouter than our superfine cloth in general, and am of opinion that such cloth is well worth nineteen shillings a yard, or more. I return the cloth by the bearer; and have the honour to be, &c. &c.

'JOHN WALLACE.'

'The first grey lamb bred by Sir JOSEPH, was dropped in the year 1789, and clipped in 1790, at which time the Spanish breed had been five years in England, and fourteen years out of Spain. This lamb and another, both males, were kept for castration, which is known to ameliorate the wool; but Sir JOSEPH did not chuse to obstruct his experiments, which were carrying on in several parts of

of the kingdom, by castrating white lambs of the pure Spanish blood.

'The deduction from this experiment, that cloth may be made from the wool of sheep fourteen years after the original stock has been imported from Spain, as fine at least as that usually manufactured from imported Spanish wool, appears evident. For the arrangement of it, we are indebted to the judicious discrimination of Mr. WANSEY.

'By the colour of the fleeces, all suspicion of Spanish imported wool being mixed in the cloth, is done away, for no coloured Spanish wool is sent out of Spain, and moreover, the fleeces being only three in number, all idea of a small portion of very fine wool having been carefully selected from a much larger quantity of inferior quality, is precluded.'—*P. Foot.*

House-Lambs.—The ewes are always, without exception, of the Dorsetshire breed, and even of these there are not more than one in three that will lamb sufficiently early for the purpose of house-lamb.

Those of large size, with white noses, are in most esteem; any thing like black on that part, would occasion its being rejected.

The early lambing ewes are sought for by the breeders of this county with great diligence throughout the county of Dorset, and at the fairs where such stock are usually sold. The prices vary, from 40*s.* to 50*s.*

Such lambs as can be warranted *of a fair complexion after being butchered,* are held in the highest esteem, which those bought promiscuously in Dorsetshire, or at the fairs, cannot be: *this preference induces those breeders and sucklers who are in the secret, to select rams which they can depend on, for getting lambs whose meat shall be of that quality.*

The sucklers, salesmen, and butchers of London, are aware that such lambs as have *sharp barbs* on the inside of their lips, are certainly of a *deep colour* after being butchered; and all those whose *barbs* are naturally *blunt*, do as certainly *produce fair meat*.

This knowledge has been the occasion of *many lambs of the latter kind* being kept for rams, and *sent into Dorsetshire, expressly for the purpose of improving the colour of the flesh of house-lambs.*

The issue of such rams can generally be warranted fair, and such meat always sells at a higher price: hence arose the mistaken notion, that Middlesex rams were necessary to procure house-lambs.

The sheep which begin to lamb about Michaelmas, are kept in the close during the day, and in the house during the night, until they have produced twenty or thirty lambs. These lambs are then put into a lamb-house, which is kept constantly well littered with clean wheat straw; and chalk*, both in lump and in powder, is provided for them to lick, in order to prevent looseness, and thereby preserve the lambs in health. As a prevention against gnawing the boards, or eating each other's wool, a little wheat straw is placed, with the ears downwards, in a rack within their reach, with which they amuse themselves, and of which they eat a small quantity.

In this house they are kept, with great care and attention, until fit for the butcher.

The mothers of the lambs are turned, every night at eight o'clock, into the lamb-house to their offspring.—At six o'clock in the morning these mothers are separated from their lambs, and turned into the pastures; and at

* 'The chalk is, usually, previously baked in an oven.'—*Mr. William Cole.*

eight

eight o'clock, such ewes as have lost their own lambs, and those ewes whose lambs are sold, are brought in, and held by the head till the lambs by turns suck them clean: they are then turned into the pasture; and at twelve o'clock the mothers of the lambs are driven from the pasture into the lamb-house for an hour, in the course of which time each lamb is suckled by its mother. At four o'clock all the ewes that have not lambs of their own are again brought to the lamb-house, and held for the lambs to suck; and at eight the mothers of the lambs are brought to them for the night.

If a ewe gives more milk than its lamb will suck, the superabundance is given to the twins, or to any other lamb whose mother may not be able to furnish it with sufficient food. The shepherd must in this case hold the ewe, or she would not suffer the strange lamb to suck. From their timid nature, it is extremely essential that they should be kept free from every species of unnecessary disturbance. This method of suckling is continued all the year.

As well to support the ewes, as to fatten the lambs, the former are provided with plenty and variety of food. In addition to after-grass, turnips, cole, rye, tares, and clover, are added the best cured second cut-hay, brewers' grains*, bran, pollard, oats, ground-barley, oil-cake, and even lintseed. This diet produces plenty of milk, of the most nutritious kind, and that promotes growth and fat in the lambs. A contrary system would render the lambs stunted, in which case, no diet or contrivance could make them either large or fat.

* Brewers' grains were first given to ewes by the late Mr. Naylor, of this county. He also was the first person who pulled out all the remaining front teeth of a broken-mouthed ewe; observing that they fed much better without teeth, than with the loss of one or two.

The breeders select such of the lambs as become fat enough, and of proper age (about eight weeks old) for slaughter, and send them to market during December, and three or four succeeding months, at prices which vary from two guineas to five, and the rest of the year at about two guineas each.

Every possible care should be taken to preserve the ewes in good health, and keep them clean; if they have any pitch mark on them when they lamb, it must be cut off before they are taken into the house, or the lambs will eat it, and it will impede their future growth.

The lamb-house is generally too hot, comparatively with the state of the atmosphere; successively changing the ewes from heat to cold, is so very injurious to them, and the degree of exhaustion so considerable, that it is no uncommon thing for a ewe or two to die in the night.

It sometimes happens, that a ewe has an infectious pimple on her nipple, that in a short time occasions a sore mouth in her lamb; the latter frequently sucks more ewes than one, which communicates the disease to other ewes, and from them to other lambs. In that manner, many or all of them may become infected. This disease is so injurious to the lambs, that a good shepherd is careful to discover it early, and separate those that have the contagion from the rest.

'A lamb-house, to suckle from 160 to 180 lambs at a time, should be 70 feet long and 18 feet broad, with three coops of different sizes at each end, so constructed as to divide the lambs according to their ages.

'The ewes, when separated from the lambs, ought to be so disposed as to enable the lambs to find their mothers without trouble; and for this purpose deal hurdles are used, placed about the middle of the sheep-house.

'Punctuality of time in letting the ewes to the lambs, and

and keeping the lamb-house very clean littered, are very necessary precautions.'

A friend of mine, who is well acquainted with the subject, says the farmers of Middlesex do not now rear half so many house-lambs as they did about twenty years ago. In Surrey they are likewise falling off. The suckling system is removing to a greater distance from the *metropolis*, to *which place* many fat lambs are now sent alive, in light four-wheeled covered carriages.

Grass-Lambs.—The vicinity of Smithfield-market, makes early grass-lambs an object of considerable importance to the farmers of this county. The Dorset ewes are chiefly selected for this purpose. They are purchased at Weyhill, Kingston, and other fairs, forward enough to drop their lambs in January. The price from 30*s.* to 40*s.* The breeders keep the ewes and lambs principally on turnips, and second-crop hay. They sell the lambs in the months of April, May and June, fat, at from 30*s.* to two guineas each.

The ewes being dried early, are fattened and brought to market about Michaelmas.

The wool is about three pounds and a half, which, at 1*s.* 2*d.*, amounts to 4*s.*

The whole of the stock is cleared within the year, and the profit or loss thereby ascertained. The account is nearly as follows:

DORSETSHIRE SHEEP.

	£.	s.	d.
The lambs average	1	15	0
The ewes ditto	1	18	0
The wool ditto	0	4	0
Together	£.3	17	0

Brought

	£.	s.	d.
Brought forward	3	17	0
Deduct prime cost of the ewe	1	15	0
Remains, the increase of a Dorsetshire ewe in one *year*, about	£.2	2	0

SOUTH DOWN SHEEP.

The lambs sold, average	1	8	0
The ewes fat, sell for more than they cost when lean	0	6	0
The wool rather exceeds two pounds and a half, and sells at 2s. or	0	5	0
The increase of a South-down ewe in one year, is about	£.1	18	0

Such farmers as prefer twin lambs, put the ewes to superior keep a few weeks before the rams are admitted. This likewise brings the lambs more nearly together, than when they are put to the rams in low condition. Another shepherd is of opinion, that ewes ought to have an increase of keep a few weeks previous to their lambing, in order to produce a high-bred, hardy lamb, and a fleece of wool at the time of lambing. This cannot be done without two or three weeks good keep immediately before the rams. Likewise the ration of every ewe ought to be increased a few weeks before the time of her lambing.

NOTES.

[illegible]

om 22*s.* to 24*s.* The ewes are certainly now higher, and I se that the lambs, from the general rise of provisions, must These lambs were yeaned in the turnips at Walton on Thames, from them.'—*Sir Rich. Sutton.*

umber of ewes are kept in this county, for one of the most rposes, and on a larger scale, than in any other part of the mean the breeding and fattening house-lambs for the Lon- ; which originated in Middlesex, and begins now to spread ner parts of the Island. It is not only a very profitable branch but also furnishes a market for the after-math of the county, into hay; which, if got in tolerable order, is said to afford proper for the ewes during the time of suckling. And if the s so unfavourable that this second (and I believe sometimes f grass is not fit for the above use, it is sold in London for a, glass, and other goods, for which the softness of its tex- : a proper material.'—*Anonymous.*

dum of a Practice in France, for improving the Breed of Sheep.

a kind of sheep called beron, or perrot, in the mountains of which are reared in a peculiar manner. From the time they y are frequently bathed in cold water, which makes them nd robust, and gives them an extraordinary appetite. Their urishment is the meal of wheat or barley, mixed with milk. is nourishing food, they soon become larger and fatter than of the same age. The meat is excellent, and much sought he fleece is longer, thicker, and finer, than others of the

litional proof of the efficacy of the above practice of bathing l water, it is proper to observe, that it is now found of the when young turkies come too early, or when the season is e them every morning in cold water, for eight or ten days, hem a pepper-corn every day.'

some facts on the management of ewes, for rearing both ass-lamb, in Mr. MARSHALL's Southern Counties, v. ii. p. 199.

SECT.

SECT. III.—HORSES:

AND THEIR USE IN HUSBANDRY COMPARED WITH THAT OF OXEN.

'NUMBER of horses in the cities of London and Westmister, and in the county of Middlesex:

	Horses paying the duty of 10s.	Horses paying 2s. duty.
London	2,944	1,183
Westminster	5,613	1,630
Middlesex	9,709	9,896
18*th March*, 1797.	18,266	12,709

'Few horses of any excellency are bred in the county of Middlesex. The farmers in general employ the produce of their land in a more profitable way, and supply themselves with cart-horses, which are compact and bony, at the different fairs in the neighbouring counties, and at the repositories and stables of the several dealers in the metropolis. Many of the horses used in the business of husbandry in this county, as well as those used by the brewers and carmen in London, are bred in Leicestershire, and the adjoining counties. They are generally bought by country dealers, at two or three years old, and sold by them to the farmers of Wiltshire, Hampshire, and Berkshire, who work them gently the first year, and keep them on until they are about five years old, when they sell them to the London dealers (who are always looking out for horses for the brewers and carmen) at very high prices, being then of a proper age for constant work.'

'The draught-horses in the possession of the brewers and distillers, are, as to strength and figure, scarcely to be equalled.'

'Many

'Many of the saddle and coach-horses are bred in Yorkshire, and brought from that and other counties by the dealers.'

Breeding.—If the breeder's object be *draught*, any mare that is noted for a *quick walk*, and *powerful draught*, and carrying *much flesh*, should be kept for breeding, and should be put to a horse possessing the same qualities.

Their offspring should not be crossed, without full proof that such other breed has the same qualities in at least an equal degree. The same rule should be observed as to breeding for the saddle, the coach, the race, and for the procuring of famous trotting horses. If the last property may be supposed to possess much merit, the breed might be raised from such a stock as that of a mare poney of Messrs. COOK, Southwark, which trotted ten miles from the Borough, Southwark, towards Sutton, which is by no means either a good or level road, in thirty-two minutes and an half.

The foregoing system of breeding, from the most perfect animals of their kind, was new in this country, as to every creature except race-horses, till the late Mr. BAKEWELL, with a superior degree of discernment, applied it to other cattle. The example which he set, was soon adopted by Messrs. CULLEY and many others: from this small begining has resulted great benefits to individuals and the nation. The original hint for breeding race-horses from selected animals in this country, was taken from the practice of the Arabians. These people are represented as having a breed of horses at this time, whose genealogy is accurately recorded from the stables of King SOLOMON, or at least for two-thousand years. So far is this breed from having degenerated by the practice of breeding in similar blood, that it is nearly demonstrable, they are now greatly superior

rior to the original stock from which they have been bred. In the first instance, they could only consist of one couple selected with the judgment of a BAKEWELL, from the general breed of that country: which latter have continued till this day to be in no higher estimation than the ordinary horses of Britain. A similar degree of selection is the most promising means for improving all our domestic animals

Feeding Farm Horses.—Rye, and early sown winter tares on land highly manured, will be ready by the first day in May, and may be daily mown, and given to horses in the stable for three months, with a bushel of beans per week each horse. From that time till the first of November, they may lie in the grass closes that have been cleared of the hay, and be allowed two bushels of beans each horse per week. The weather will then be growing too cold for working horses to lie out; they must be taken into the stable, and be allowed chopped tare hay as much as they will eat, mixed with one bushel of beans and a bushel of horse-pollard, and be racked up with unthrashed tare hay at night, for six months, when the rye and tares will be again ready. According to this mode of feeding horses, tares must be grown in sufficient quantity to supply them all the year, or the deficiency must be made up with clover hay. For want of both tares and clover (though no good farmer should be without plenty of both), unthrashed oats may be cut into chaff, of which they must have as much as they will eat; be racked up with the best hay, and have about five pecks of beans weekly. By the former method one horse will eat eight quarter of beans, and twenty-six bushels of pollard, which cost about 13*l.*

Some persons who have no better than meadow hay, feed

feed with oats and beans, in the proportion of ten quarter of the former, and twenty bushels of the latter, for a year; these cost about 15*l.*

Tare hay unthrashed, is a hearty dry food; oats are probably a more suitable corn for horses along with this hay, than beans. This may be continued 26 weeks, from October till May with six pecks of oats weekly, it will be nearly five quarters, at 22*s.* is ..... £.5 10 0

Soiled during May, June and July, 13 weeks, with rye, tares, and clover, and an allowance of one bushel of beans per week, is 13 bushels. Then turned into after-grass during August, September, and October, 13 weeks, with an allowance of two bushels of beans weekly, is 26 bushels; together, nearly five quarters, at 30*s.* is	7 10 0
In this good method of supporting farm-horses, the corn for one year would cost	13 0 0

The expense of working cattle in Middlesex, is increased by the connexion of the farms with London. When they are employed on the land, there is no material waste; but on the road to and from town that is considerable, and the thefts of servants are then at the highest. At home a horse has been found to require of hay six loads and a fourth part of a load; but on the road the same horse has cost his master seven loads and a half. Most of the farm horses of this county are on the road about one moiety of their time; therefore, the hay which they annually consume is nearly seven loads.

Hay eaten by cattle on the farm, ought to be estimated at what it could be sold for in the stack; which is nearly 20*s.* per load below the price at the markets.

One

One fourth of the weight of grass, tares, and clover, is the weight of the hay which could be made of them. The latter may every where be sold for ready money; but it costs nearly 40*s.* per load in making and marketting; therefore, the best way of valuing grass and other green fodder, is one-fourth of their weight at 40*s.* per load under the price of such hay as they are capable of making.

Straw, when it can be sold for 40*s.* per load at market, is worth 1*l.* 4*s.* 6*d.* in the barn; as the other 15*s.* 6*d.* would be expended in carrying it through the medium of a market to a consumer.

Corn, in like manner, is of less value on the farm where it was grown, than it is on being delivered to a purchaser, after having been sold at a public market. The expenses in the latter case are in Middlesex 1*s.* 6*d.* or 2*s.* per quarter; therefore, clean corn given to cattle at home should be estimated so much below the market price. And in the case of cutting sheaves of corn and straw into chaff for cattle, a further deduction may be made; equivalent to the saving in the labour of thrashing and cleansing the corn. This is 6*s.* per quarter, and that sum added to the former 2*s.*, produces 8*s.*, or 1*s.* per bushel less than the market price, as the value of corn given in this manner to the farmer's horses.

Having made these preliminary observations, I shall proceed to estimate

THE

JAL EXPENSE OF A FARM-HORSE IN MIDDLESEX.

	£.	s.	d.
oads at 4*l.* (the market price 5*l.*) is	28	0	0
e labour of cutting it, two truss of d a little straw used with it, produces uarter, of 16 bushels, that costs 16*d.*, and as three horses eat weekly shels, one horse will cost in this f labour, annually about.....	1	10	0
quarters of beans at 30*s.* (the market 2*s.*) is	15	0	0
arters of oats at 22*s.* (the market price hen this corn is given, is 15*l.* 8*s.* o loads at 25*s.* (the market price 40*s.*)	2	10	0
Together	£.47	0	0

f these horses are fed with green food from three onths in the summer, which is cheaper than hay, pense of converting such things into it: this oc- saving of about 40*s.* therefore deduct that sum foregoing, and the remainder is 45*l.*

e that is always on the farm would reduce the to 40*l.*; and one that is nearly all his time on the uld increase it to 50*l.*

her items are:

	At Home.			On the Road.		
	£.	s.	d.	£.	s.	d.
- - - - - - - -	1	0	0	2	0	0
d accidents, - - - - -	1	10	0	2	0	0
of first cost, decline in value, and interest,	3	0	0	4	0	0
Carry forward -	£.5	10	0	8	0	0

	At Home.			On the Road.		
	£.	s.	d.	£.	s.	d.
Brought forward - -	5	10	0	8	0	0
The like as to harness, - - - - - -	1	10	0	2	0	0
The like as to implements, - - - - -	3	0	0	4	0	0
Exclusive of the diet and bed of a labouring horse, his other charges are from - - -	10	0	0 to	14	0	0
The tax on draught horses, - - -	0	12	6	0	12	6
The last six items, amount from - - -	10	12	6 to	14	12	6
To these sums bring forward for his diet and bed	40	0	0	50	0	0
The entire expense of such a horse, is annually from - - - - - - - -	£.50	12	6 to	64	12	6

At home it is barely 20*s.* per week: on the roads it is nearly 25*s.* per week.

Suppose such a horse to work 300 days annually, his daily expense will in the former case be nearly 3*s.* 6*d.*; in the latter 4*s.* 6*d.*; or for a horse that is one moiety of his time on the road 4*s.*

The horses which belong to brewers, distillers, coal merchants, and others, are the most valuable of their kind; they are kept in the highest style; their harness and implements are also more costly; in this manner may be made an annual addition of 15*l.* 7*s.* 6*d.*

And as the owners of these fine horses buy their hay, corn, and straw at market, these things cost them more than they do a farmer, by 10*l.* Add the last two sums of 15*l.* 7*s.* 6*d.* and 10*l.* to the foregoing 64*l.* 12*s.* 6*d.* and the amount will shew that each of these horses cost their owners annually about 90*l.* If we suppose them to work 300 days in each year, the last sum is exactly 6*s.* per day.

The foregoing estimates are calculated to assist us in discovering that one horse consumes the corn of two acres and a half; the straw of nearly one of these acres; and when supported wholly on the produce of arable land, in

rye,

tares, and clover, about two acres and a quarter. wo and a half and two and a quarter added together, l be four acres and three quarters; but there is a ss of the straw of an acre and a half: if we allow > be equivalent to the three-fourths of an acre, the ning *four acres* will be required for the support of F these horses. Few horses are kept altogether on roduce of arable land. Where the whole of their s from meadows, it will require from three and a o four and a quarter acres to produce the hay which are herein before shewn to consume. Horses fed in manner, and employed wholly on a farm, consume roduce of rather a large *five acres;* or, entirely on road, six acres; or, as most of the horses in this ity are on the road about half their time, they require acres and a half.

y comparing these accounts, it appears that one horse ch works constantly on the roads, requires four acres a quarter of meadow hay; whereas the same animal be better supported by two acres and a quarter of le land. The economy of growing tares and clover ach an extent as may be capable of keeping horses so ked entirely from meadow hay, is no less than two s to every horse. In the greatest number of cases ch occur in all England, horses are nearly constantly the farm; even then the difference is one acre and a rter per horse in favour of tares and clover. And average of all the farming teams in this county, which half their time on the roads, the advantage of arable luce is one acre and a half per horse; or six acres for team of four horses.

he horses of brewers, distillers, coal merchants, and rs, being of larger size, and kept more highly than

farmers' horses, require an extra acre; but their hay is all the produce of arable land, therefore five acres will support one of them.

The mail-coach, and other horses of that description, are allowed as many oats as they can eat; they are supposed to consume the produce of three acres and a half, or 17 quarters of corn; but they eat very little hay, perhaps 12 lb. per day; that is, two loads and six truss, or the produce of one acre and a half of the best meadow hay; therefore one of these horses is provided for by five acres. On the whole, setting all the wretched horses to be met with, which are supported with less than the produce of five acres, against those in or near London, and other opulent towns and places, which consume more than five acres, and including every horse in the nation, they would average as near as can possibly be estimated, five acres each.

Dray-Horses.—The brewers in London are (says Mr. ALEXANDER M'LEAY), chiefly supplied with horses by the Berkshire farmers, who buy them young from Northamptonshire, and work them two or three years before they sell them.

Their stables are paved with stone, and they are daily cleansed and littered, by men whose business it is to attend them night and day.

The orders to these men are, "keep the horses well bedded in every season, for it is necessary that they should be kept warm and well fed in the stable, to recover them from the effects of the hard labour which they have performed in the day." This is reasonable, and it is thought the health of dray-horses depends much on such kind treatment. Currying has generally been thought of great importance in the management of horses; but dray-horses

are

are curried very little. Indeed as they sometimes have no more than six hours in twenty-four for rest and feeding, it cannot be supposed that there is much time employed in currying them. They are, however, well rubbed down, after they come in from work. The racks are always supplied with plenty of good hay, in order that the horses may have as much as they can eat. They are served with the best oats, before they go to work in the morning, and again about half an hour after they come from work. Beans are not generally given; but I do not know for what reason. It was customary some years ago, for brewers to give grains to their horses; it was found that horses so fed, became rotten, and died in a few years. On dissection they were also found to have large stony concretions in their bladders; and, at present no grains are given to the horses of the principal brewers.

'In the course of these inquiries (says Mr. M'LEAY), I was told, that in Sweden it is usual for horses to lie on boards; it is principally for the sake of warmth that they have substituted boards, for stones in that cold country; but another reason is, that a less quantity of litter is necessary with boards than with stones. It would perhaps in some cases be an improvement on the practice of this country, to have a stable floored with plank.

Observation by Mr. Cole, respecting Horses in London.

Hay made of Ray-grass and Clover—Is good food for horses in the winter months; but after Lady-day, this kind of hay becomes dry, and loses its virtue. Hence horses, particularly coach and saddle horses, do not thrive on it. *Meadow-hay* is certainly preferable for coach or saddle horses, as the moisture remains much longer in it. Draught horses may do on the hay of clover or ray-grass, but it is not suitable to horses of greater speed.

Corn.—*Good oats*, I presume, are better corn for coach, or saddle horses, than *beans*; the former are cooler, and the latter are prejudicial to them; though beans are certainly useful for draught horses, when mixed with chaff, as the latter kind of horses are not so liable to be heated in their blood as the former. Barley is, I think, too heating for any horse, even of the draught kind: this corn occasions thirst, and may be the cause of surfeits.

Colour.—The brown bays are in general the most hardy; and black is a very good colour. With regard to grey horses, an objection to them is, that they are apt to grow blind: next to them, chesnuts have that defect.

Longevity.—The longevity of horses in London is shorter than in the country, where, being more in the open air, like human beings, their lungs are less liable to decay, especially where they have grass in the summer months. They generally live in London from sixteen to eighteen; and in the country from twenty to twenty-five years.

Grease.—This is a very loathsome disease in the heels of horses; which may generally be removed in the following manner.

Towards night, clip much of the hair off the parts which are diseased; then make them clean and dry. Take roch alum and roman vitriol, of each one ounce, in very fine powder; half a pint of verjuice, and one pound of treacle. Put these ingredients into an earthen-ware pipkin, and place it on the fire; simmer them till they are dissolved, and, by occasionally stirring, intimately mixed. The last thing at night anoint the diseased parts of the legs with the medicine, while it is warm, and rub it well in with your hand. Do not permit the horse to go into water, and

and keep his feet dry; at the end of 48 hours repeat the anointing and rubbing in of the medicine. Keep the legs dry for three or four days longer, and then wash them clean with soap and tepid water. The whole operation will require the horse to be kept from labour for about a week.

HORSES IN COMPARISON WITH OXEN.

OXEN are very little used for draught in this county. The practice however is not entirely given up: as I suppose there are now about thirteen working oxen in the county, though I believe not one of them in the hands of a professional farmer*.

From a variety of observations made on the effects produced by the use of oxen in working arable land, I am decidedly of opinion that they are much less fit than horses on any land whatever, for the purpose of harrowing or rolling wheat in the spring, and even for the covering of spring-sown crops of every kind.

The treading of oxen, works wet clayey soils into a state of steril mortar, much more than the treading of horses. The formation of the feet of oxen renders them very *unfit to be used in either the plough, the harrow, or the roller, on all clays, and other adhesive soils*, while they are wet, or at least not sufficiently dry to prevent that clinging, mortaring and poaching, which, on such land, ought to be avoided by all possible means. In short, *they are as much inferior*

* Mr. FOOT's Report in 1793, mentions the parties who worked 23 oxen. Since which time Mr. JENKINS has disused - - - 10

The rest are only - - 13

Whether these are continued at work, has not come to my knowledge. —*J. M.*

to horses, on all wet soils for these purposes, as turkies are to swans for the purpose of swimming.

Neither can oxen be used on land that abounds with flints, or other stones; which will for ever exclude them from a very large proportion of the land in Britain.

Most of the meadow land in England, is generally much too moist, to bear the salutary operations of bush-harrowing and rolling by oxen so well as with horses.

It must be allowed on all hands, that *oxen are by no means equal to horses on turnpike roads*, which being usually mended with flints, stone, and other hard and cutting substances, injure their feet so much, that they would scarcely hold out even for a few short journies; and they must be still less proper to be used in such teams as are half, or more of their time on these roads, as is the case with most of the teams in this county.

The division, or parting, in the foot of an ox, considerably *weakens the part*, and in that manner renders him less able to perform constant labour of any kind, so well as a horse of the same weight is found to do. And accordingly, experience has proved, that an ox cannot do hard labour daily, for a considerable length of time, even on the farm, nor on roads that are ever so suitable for his feet, nor under any circumstance whatever. He is only capable of doing very moderate labour, and that in cool weather.

In the summer season oxen are much more fatigued with exertion than horses, for in every hot day they must be allowed to stop occasionally, for the purpose of recovering their breath; and as this season is usually a busy time with farmers, horses must then have an obvious advantage, as they do not require to stop so often in the course of their work.

The bott-fly is very troublesome in summer, and oxen are not able to endure the attacks of it; they are infinitely more

more ungovernable, when so attacked, than draught horses are, under the disturbance of any insect whatever.

There are some large farms in every district, which have coarse pastures that would support oxen, and these might be worked during the busy seasons with the fallacious appearance of advantage. But this can only be done so long as such pasture is continued in so uncultivated and unprofitable a state. The oxen which are only worked at such times, will be so awkward as to render their labour of the least possible value. They will be unfit for labour, for want of more constant employment, and the little work they do, will be sufficient to render them unfit for the butcher. Being disqualified for labour, without being fit for the butcher, would probably be the least profitable way of disposing of their food. It would be a losing plan, to keep an ox a year, for the sake of his doing thirty or forty days' work: he should be kept either for the sole purpose of labour, or for the butcher.

It is no proof of the utility of oxen, to say they can in part support themselves in coarse rush-bearing pastures; this is rather making one barbarism become a bad apology for another; as every such pasture is in a very imperfect state of cultivation, and ought to be improved either into good arable or a fine pasture. Consequently every estimate of the expense of supporting working oxen, should be made from such vegetables only as can be grown on land highly cultivated. Horses may be supported on very ordinary food, even furze bushes, and do as much labour as oxen that are fed in coarse pastures are capable of performing.

It is said that horses are consigned to the kennel: admitted; but in that case they supply the place of oxen and sheep. If the agriculture of the country was performed

formed by oxen, there would not be horse-flesh for the dogs, and consequently ordinary beef would be given to them. In case draught horses should be superseded by oxen, then would one moiety of their flesh be required to support the present number of dogs; therefore the increase of beef would only be equal to one half of the number of such draught oxen; and the demand on them would be increased by a very great decrease in the number and produce of cows: so much so, that no reduction in the price of beef could possibly take place; but, on the contrary, a considerable rise in price on the produce of arable land would be certain, in order to pay the more expensive tilling of land by oxen.

We should then cease to be surprised, as I was in the summer of the year 1800, at the sight of eight oxen in a waggon of Sir FREDERICK EVELYN's, drawing 500 bricks, on a good road, between Dorking and Shier. There were two men to drive these oxen, whereas one man and three or four horses draw 1000 bricks from every brick field near London. Those persons are strangely mistaken, who persist in the use of the ox, 'which has been attempted and abandoned, from a clear conviction of the superiority of the horse, both for the purpose of tillage and the road.'

It is well known that oxen were formerly much more generally used by the farmers of England than they are at present; and it is fair to suppose, they had substantial reasons for discontinuing them. Oxen, probably, first gave place to horse-teams in all work to be done on roads covered with hard materials; and next, for every purpose where the work required either active exertion, or continued labour. I apprehend that, from their inability for these purposes, and from its being found that in constant work

work they must be fed as highly as horses, both masters and servants were ultimately induced to give a preference to the latter.

In all cases *where the journies are particularly long, horses have always deservedly taken the lead.*

The increase of great towns, likewise, has a tendency to create constant employment for the teams of farmers in the vicinity of such towns, in the carrying their produce thither, and returning with manure. In such situations, horses must be allowed to have the preference.

The modern improvements in agriculture have also a considerable tendency towards increasing the number of draught horses at the expense of ox-teams, by reason of the much greater quantity of labour and exertion required in carrying on an improved system of farming, than was usually thought necessary under a less spirited course of husbandry.

It is probable also, that the ultimate destination of an ox, to serve as the food of man, will for ever prevent his being kept longer than till he has acquired his full growth, consequently he will be sold just at the time when his strength is such as to make him equal to the task of performing the different works of a farm; and it is not to be expected that the farmer will keep his oxen after they have attained this age, as they uniformly decrease in point of profit from that time.

Indeed Providence seems to have intended horses to perform the labour, and promote the pleasures of men; and oxen to form a principal part of their food.

The butchers inform me, that the flesh of an ox that has been much worked, is as hard as brawn in every part that has been pressed by the harness; and I apprehend that every sinew and muscle of his body will be tougher,

and

and less eatable, in proportion to the quantity of labour he has performed, and the number of years he has been kept at it.

Both oxen and horses are nearly equally unfit for constant and severe labour until they are six years old; and in case oxen were worked during all their prime, or until they were twelve or more years of age, I cannot suppose they would then be very prime beef.

Two oxen have usually been, and still are, estimated as only equal in draught to one horse, by forty-nine farmers in every fifty.

Round Lewes, Sussex, for several miles, most of the farmers have a team, or two, of oxen; they all draw in yokes, and in every case (nearly) where horses and they are employed in similar work, two oxen do the labour of one horse. The team is usually four horses, or eight oxen; but in October 1805 I met ten oxen, all large valuable cattle, drawing a waggon-load of chalk, along a smooth hard road, which was measured in my presence, and found two contain just two cubical yards, (54 feet): three horses would have performed as much labour as these ten oxen were doing.

It used to be supposed that an ox had more time to lie down, and rest his limbs, than a horse could have, on account of their different modes of feeding: but this advantage is balanced by the present mode of feeding horses with chaff.

During the summer months, when they both lie in pasture, the dung of an ox is more valuable than that of a horse.

If oxen have the advantage over horses in any other respect than the trivial one just mentioned, it can only be as an auxiliary team; where there is not business sufficient to keep it in constant daily work; and then only in the

the seasons of winter and spring, and where they can be supported with turnips, or cabbages, and oaten straw. Even in these seasons, under a deficiency, or want, of that food, which will make it necessary to feed them with hay, horses are more eligible; as they certainly are in summer and autumn, when tares, clover and grass abound.

Again, although oxen are not generally allowed corn, but are principally confined to a diet of hay, and when out of work, to turnips and oaten straw; yet it should be considered, that they are universally put to do the most easy works of a farm, and which do not require dispatch, consequently it is found that hay, and roots, or cabbages, are sufficient to support them under such moderate labour. It is by no means determined that horses could not perform the same moderate degree of labour with as cheap a food; but it admits of no question, that neither oxen nor horses can support so much labour when fed with hay alone, as they can do with the addition of better keep. As horses are constantly put to do the heaviest work, and such particularly as requires dispatch, it should not excite surprise, that in order to perform such increased labour, they should require a more hearty and nutritious diet.

The busy seasons of seed-time, hay-making, and harvesting, require a much greater degree of speed and activity than is at all compatible with the slow and solemn pace of oxen; and although it must be allowed that horses must be highly kept, in order to enable them to perform what may be called severe labour with activity, yet oxen, let their feed be what it may, cannot, from their very nature, perform any labour whatever with equal facility and dispatch.

The cause of oxen cannot be supported against horses by such accounts as are published by Mr. KENT, and Mr. YOUNG. The comparative statement in the Annals of

Agriculture, vol. xxxii. p. 168, either has not been drawn from authentic documents, or it is not fairly made. Mr. YOUNG, or Mr. KENT, for it is not clearly expressed which of them is the writer, says, in page 167, that statement represents what was the expense of horses, and what is the expense of oxen. The next two pages contain the account, even to the day of the month. Now these expressions are calculated to induce their readers to suppose horses had been employed during several years, and were superseded by oxen, who have worked a sufficient time to ascertain the expense of labour performed by each of these teams. If this were true, the dates of the expense of labour done by horses would have been five or seven years antecedent to the dates of the experiments by oxen; but, unfortunately for the writer of such a misrepresentation, the accounts of horses and oxen bear the same date, which proves at least one of them to be as imaginary, as the subsequent part of this paper will shew them to be fallacious.

The author of that statement cannot produce books of real business, from which the account in pages 168 and 169 is said to be drawn, which would warrant any such conclusion as is there adopted. I thus publicly call on him to produce it if he can, otherwise he will justly be suspected of writing, with the intention of misleading the general opinion.

The agricultural world ought to be made acquainted with the manner in which comparisons are made, between horses and oxen on the royal farms. The farm at East Sheen, lies at a short distance from my occasional residence, and consequently I have some opportunities of seeing the manner in which it is cultivated. At that place there are four Norfolk ploughs, which most people know are very light; each of them are drawn by four oxen;

oxen; and there is one Berkshire plough, which is known to be one of the heaviest in Britain, drawn by two horses. The oxen are the most fit of their kind for the purpose of draught, and the horses are the least fit for it. The horses are not the chesnut punch from Suffolk or Norfolk, nor are they the Yorkshire one-third, or one-half blood, but they are of the sluggardly black breed; and even two of these slow-paced horses are studiously loaded with one of the heaviest ploughs in the kingdom, in order to retard their pace, and prevent their walking faster than the ox-teams. Each team of four oxen draws a feather, and the two horses are made to draw a ton. Under these circumstances, the ox-teams are said to keep pace with that of the horses.

I shall not in this place enter on the comparative expense of horse and ox-teams, otherwise it would clearly appear to be more economical to use horses than oxen, in ploughing that farm. Four oxen, one man, and a stout boy, in one case, do actually as much labour as two horses and one man in the other; the latter is evidently a team of the less expense, and I believe it to be so, at least to the amount of the keep of two oxen and a boy, which, at the present price of labour and clover hay, is equivalent to 100*l.* per annum.

It may be admitted, that four good oxen, highly fed with hay and corn, are capable of ploughing a barley soil that is free from stones, for a year together; but two good horses can do the same work as well, or better, and extend their services to other labour, which cannot be performed by the oxen.

A very celebrated character, of great energy, of very superior intelligence, and one of the most successful farmers in Britain, a few years ago was a strenuous advo-

cate

cate for labouring oxen, and he employed eighty. These were the fittest of their kind; but he became convinced that labour is more cheaply performed by horses; and accordingly he reduced the number of his ox-teams, and increased those of horses. The experience of Mr. CULLEY is of the most extensive kind, and he has given up oxen: the same gentleman, from conviction, has adopted horses. Such an example proves more than a volume of reasoning, that horses are preferable to oxen for the purpose of labour.

The estimates which Mr. BAILEY (of well-earned fame), of Northumberland, has made, founded on the quantity of food actually consumed by horses and oxen, and the labour performed by them, have proved that every individual ox employed in labour is more expensive than a horse; the former are barely capable of performing half so much labour as the latter; therefore any quantity of land may be ploughed by horses at half the expense which it would cost in tilling the same land by oxen*.

It is very clear, that those persons who prefer horses to oxen for the purpose of labour, display superior knowledge in agriculture. This opinion is sanctioned by the practice of nine tenths of the best husbandmen in the nation. In proportion as Britons became enlightened, they laid aside ox-teams, and experience has now so completely

* Three of Mr. BAILEY's estimates, which are before me, state the annual expense of four oxen at 86*l.* 14*s.* 10*d.* 87*l.* 12*s.* and 99*l.* 2*s.*; together 273*l.* 8*s.* 10*d.*; the average of these is 91*l.* 8*s.* and that divided by 4, proves the expense of each ox to be 22*l.* 15*s.* 9*d.* The annual charge of two horses, the same gentleman states at 42*l.* 6*s.*; divide that sum by 2, and it will give the expense of one horse, 21*l.* 3*s.* which is 1*l.* 12*s.* 9*d.* less than what is requisite for the maintenance of an ox.—*J. M.*

established

established the superiority of horses, as to render their employment almost universal. And under this system, the science and practice of agriculture have improved more rapidly than at any former period of time.

The number of horses used in husbandry are nearly 1,200,000*. If half this number were to be superseded by oxen (in the foregoing proportion of two oxen to one horse), it would require 1,200,000 such cattle to do the same quantity of labour as is now done by 600,000 horses. The difference of these two numbers, would be an increase to that extent of our labouring cattle. The other 600,000, in the place of so many horses, as well as the increased number, feed in the same manner as cows, and on similar herbage; consequently the whole 1,200,000 would deprive us of the means of supporting so many cows. So unwise a measure would reduce the number of our cows to one-fourth of their present number. The veal, milk, butter and cheese, would be diminished in that proportion, and in consequence of this scanty produce of the dairy, the price would be so exorbitant, that none but the most wealthy could afford to eat of these things.

After what has been said, need I add, that every ox used in husbandry at this time, deprives the nation of a cow, and of all the comforts which that animal is calculated to bestow. The introduction of oxen to do one half the labour now done by horses, would deprive the labourers of the greater part of their diet; a dearth would be the inevitable consequence, until the number of our people were reduced to equal the scantiness of their food; or until the oxen could be fattened and slaughtered to make way for the return of the more valuable cow.

Hereafter I shall expect the farmers in theory only, who

* See page 639.

are advocates for ox-teams, to change their notes, and write in favour of a team to be drawn by cows.

In addition to the many observations which I feel myself obliged to make on this subject, it should not be forgotten, that oxen and cows cannot be fed in equal numbers with the present system of cows and horses; as the latter feed after each other much more closely than the former.

Upon the whole, I am of opinion that *the very few advantages which oxen possess, are not by any means of such consideration as to compensate for the damage which their being used would do upon some kinds of land: nor are they so proper for the general purposes of a farm, as horses, and the general substitution of labouring oxen in lieu of horses, would be really injurious to the nation.*

NOTES.

'I kept two teams of oxen for about two years; and on the most attentive comparison between them and horses, am decidedly of opinion that, including all the different seasons and kinds of labour to be done on a Middlesex farm, horses are entitled considerably to the preference.' —*Edward Jenkins.*

On the 28th of May, 1796, I attended the ploughing at Mr. Lhoyd's (Cheam, Surrey) with two ox ploughs without a driver. The land had been fallowed all the last year, ploughed quite flat, strike furrowed, and left all the winter drowning in water, being a very tenacious loam on yellow clay. Hedge-rows full of elms; two ploughs at work, with one pair of stout oxen in each. One pair about eight years old; the other four off; drawing Mr. SMALL's chain ploughs—one of them with a very well-shaped cast iron mould board; the other, an elm bent board of the neighbourhood. They turned a furrow of eleven inches, by from two to five, or an average of three and an half—the cast iron bright as silver. Their pace was 440 yards in seventeen minutes, three times tried; constant going out between seven and eight hours; deduct for stoppage and their constant draught, will be about six hours: in which time, at the said pace, they ploughed 2 roods 16 perch per day, or 3 acres, 2 roods, 16 perch per week of six days. The soil was quite free from stones, and worked very tough, and was evidently too severe labour; so much so, indeed, that the younger pair had turned themselves out of the work

the

the men said, at least ten times the day before. One of my ploughs, with two horses, would have done as much work as both these, and vastly better, as six inch furrows are better than eleven. The men observed, that if they were to take a narrower furrow than eleven inches, they should do almost nothing, as the oxen would not bear being drove much faster than the very slow pace at which I found them.

The difference in the price of hay and corn, as articles of food in the keep of horses and oxen, upon which so much reliance is placed by the advocates for oxen, on a fair comparison, will be found to turn out totally different from the conclusions they draw. This will appear in the following short statement, namely:

I now sell my hay at 5*l.* 10*s.* per 18 cwt. which is per ton	£.6	2	3¾
And buy my oats at 17*s.* 6*d.* per quarter, which is per ditto	6	2	6

Every body knows that oats contain more nourishment than hay, and being at the same price per ton, it is obvious they are the cheaper feed.

Those gentlemen, for of farmers there are none, who are advocates for the use of oxen in draught, should breed them without horns, with great strength of body, of a quick walk, and without a division in their feet.

This note is not so hyperbolical as at first sight may be imagined: if swine can be bred with whole feet, why may not neat-cattle and sheep? And Mr. MARSHALL says, "there is in this district a very extraordinary variety of the black-breed of hogs: a whole footed sort. The hoof being entire, like that of a horse, not cloven, as of hogs in general.—Vide *Midland Counties*, vol. i. a Note in p. 452.

My observations on the feeding of oxen corresponded nearly with those of Sir RICHARD SUTTON, who says, 'when I had a farm 30 years ago near St. Alban's, I procured four fine oxen out of Sussex, with a man perfectly used to them, and afterwards four more of a lighter active breed out of Pembrokeshire. *I found that my oxen, though the man fed them as he pleased, could not keep on work regularly against a team of horses. He was often obliged to beg a day's rest for a pair of them by turns, and owned they would not stand the constant work.* As to the comparative expense of their food, I found that six oxen consumed 27 truss of hay per week. Hay (I mean clover hay) was then 36*s.* a load or 1*s.* a truss. My four horses ate 10 truss of hay per week, and a bushel of oats a day, then at 16*s.* a quarter; so that they cost me 24*s.* instead of 27*s.* In this manner the oxen ate daily 36lbs. each, and the horses only 20lbs. This convinced me that *oxen do not answer where one is obliged to feed them much on hay.*

'Some years ago I bought some draught oxen ready broke, and intended to have my steers broke in so as to come in succession, but was defeated in it, by the difficulty (pretended at least) of managing mine (the labour-

ers here being quite unused to it). As to the pretended advantage of oxen, in cheapness of shoeing, I am convinced it is none at all. Oxen are very troublesome to be shod; they must generally be hobbled and thrown; and seldom keep on their shoes even three days.'—*Sir Richard Sutton.*

'Oxen are wholly incompatible; *for they could not walk upon the surface of fen land without being bogged.*'—*Huntingdon Report.*

Observations on Sir RICHARD SUTTON'S *Note, in* 1797.

Each of Sir RICHARD SUTTON'S oxen ate six loads and a half of clover-hay per annum, which, at the present price of 5*l.* 5*s.* amounts to £.					34	2 6
His horses ate 3 loads and 22 trusses of the like hay, at 5*l.* 5*s.* is - - - - - - -	18	19	2			
Oats, 91¼ bushels, at 2*s.* is - - - - -	9	2	6			
				28	1	8
Remains the cheaper feed of one horse for one year -				£. 6	0	10

Observations on Ditto in 1803.

The keep of one ox, 6½ loads of clover-hay, at 7*l.* 10*s.* is				£. 48	15	0
The keep of one horse, 3 loads and 22 truss of clover-hay, at 7*l.* 10*s.* is - - - - - -	27	1	6			
91¼ bushels of the best oats, at 3*s.* is - - -	13	13	6			
				40	15	0
Remains the cheaper feed of one horse for one year, than of one ox for same time, - - - - - - -				8	0	0

The advocates for oxen in preference to horses, are in general persons without much experience in the comparative labour of a farm, and one of their most plausible reasons is, that when the labour of a horse is done, he is consigned to the dogs, with as much certainty as an ox is fattened for the butcher. An unreasonable prejudice in the people of Britain against the eating of horse flesh, occasions this different destination of these animals, and is the means of compelling the farmer to part with a horse for a guinea, which otherwise might be fattened and sold for ten or twenty. It would be as laudable to remove such a prejudice, as it would be impolitic to urge the general use of oxen for the purpose of draught.

The celebrated Mr. MARSHALL says properly, that horses being used as an article of human food, is the second of European absurdities. *See his Midland Counties*, vol. i. p. 460. *Vale of London*, vol. ii. p. 20, and *Yorkshire*, vol. ii. p. 164-5.

The three greatest nations in the centre of Asia, the Tartars, Mogals and Mandshurs, eat both horse flesh and ox beef, and they are of opinion the former is superior. No person (except Mr. LAWRENCE, the

a farmer's calendar) ever thought of eating it without all the advantages which a good cook can give it, and which is usually bestowed on beef. These nations, more economical than the English, use the milk of mares, as well as that of cows and sheep, and employ both mares and cows in draught. And it cannot be denied, that there are many poor men in Britain, with whom cows might do a small quantity of labour, with more advantage to their owners than either horses or oxen.—*J. M.*

Mr. Kent writes, that His Majesty 'buys oxen rising three years old, keeps them one year idle, then works them three years, and afterwards fattens them for the butcher.' A more profitable system would be, to buy horses at three years old, work them three years, and then sell them.

The oxen may be bought in, each at - - - - -	£.10	0	0
Kept one year idle for - - - - - -	5	0	0
The work of 3 years supposed to be equivalent to his keep.			
His cost at the end of his work will be equal to his value, or	15	0	0
The fattening him will cost in food, labour, wear, tear and risk	10	0	0
And he will then sell for what he has cost, namely, -	£.25	0	0

A three year old colt may be bought for 15*l.*, his labour will be much superior to that of the ox, but suppose it only equivalent to his keep for 3 years: at 6 years old he would have cost the same sum as the ox, namely, 15*l.* but he will then be worth 30*l.* by which he will pay his owner a profit of 100*l.* per cent. or one-third of that sum annually*.

SECT. IV.—HOGS.

'A very large market is held on Finchley-common for the sale of this useful animal, where great numbers are

* Such persons as are determined on keeping draught oxen, should not by any means work them in yokes, as they step more freely in collars, do their labour with more ease to themselves, and admit the ploughman and carter to do their work more nearly equal to the same operations by horse-teams. The additional risk and expense in labour of training an ox to work, has usually been thought to deserve notice; but this seems to be nearly removed by putting a collar on his neck, to which attach a rope of about six or seven yards long, with a log fastened to the other end, and letting the ox draw it about as he feeds in his pasture for a week or more, before he is put into harness.

purchased fat, by the hog-butchers of London, as well as vast quantities of lean stores, brought from Shropshire, and other distant counties, to be fed by the malt-distillers. Here it may be necessary for the Board to use their endeavours to correct an error too much believed by the vulgar, that the malt-distillers' pork is not good; the hogs, it is asserted, being kept in a state of intoxication; whereas the contrary is the fact; it being notorious, that the best pork for sea voyages is that from the malt-distillers (who always finish them with *hard meat*); and it is equally certain, that the best bacon in the kingdom is made from those hogs; and he would be a bad workman, who left spirit enough in his wash to make his hogs drunk.'

It is not probable that this prejudice should be well-founded, since, upon inquiry, I find that the hogs fatted at the distilleries fetch the same price, both at the bacon-merchant's and the Victualling-office, as any other.

There is very little bacon dried in this county, except by the professed bacon-merchants. The general method is, to cure it in a salt brine, where it is kept till used as pickled pork. At many farm-houses, pork is kept three years in the pickle, and then used; by which method they are always consuming that of the fourth year; at which age it is said the fat is more firm, of better flavour, and wastes less on being boiled, than with less keeping. I met with an exception to this, indeed, at Mr. ROBINSON's Wick-house, who has an oven for smoke-drying bacon for his own use, with turf, in the true Westmoreland fashion. There is also a Mr. SYMES, who imports pickled pork from Ireland, and dries it by various methods, so as to imitate in look and flavour the bacon and hams of several of the most noted English counties. The bacon cured at the hog-butcheries about London, is but little inferior to the best. The trade inform me, that in Yorkshire it is the

it cured, and in Wiltshire the best cut up, and recom-
nd to each of those districts to adopt the other's me-
od, so as to unite the two excellencies.

For raising a superior breed of hogs, the same method
ould be resorted to, as I have recommended under the
ctions on Horses, Cattle, &c.

In the Annals of Agriculture, vol. xiv. p. 173, there
m account of a sow which brought up twelve litters of
s in seven years. She annually produced 22 pigs,
ereof 6½ died, and 15½ were reared, and sold for 21*l.*
om this sum deduct the expense of their keep (except
o months at the barn-door) 7*l.* and the remainder, being
l. a year, is for interest of stock, attendance, and
ofit.

The variety of hog with undivided hoofs, occurs in the
ston of Nurro, not far from Sassari, in the island of
rdinia.

Every farmer should be told, the gristle may be cut off
ooth from the nose of his pigs, while young, and that
will prevent their damaging his closes by turning up the
il.

The largest breed in Britain is supposed to be kept in
e neighbourhood of Rudgewick, on the borders of Sur-
y and Sussex, which feed, at two years old, to an asto-
shing weight, even to double or treble the usual weight
hogs at that age. This breed deserves to be extensively
own, and the number of them increased in most parts
his island, as they are most likely to pay much more
their feed than other breeds of a smaller size.—See the
wing letter:

"SIR,

The following are the weights of some of our hogs:
largest was fatted by Mr. THOMAS IRELAND, and

killed by JOHN OULDER, at Wisborough-green: *it weighed one hundred and sixteen stone six pounds.* Two more were fatted by Mr. IRELAND, and killed at his house; one 98 stone, and one 90 stone. Mr. EDWARD IRELAND, one 86 stone, and one 80 stone. Mr. THOMAS ELLIOTT, one 97 stone, and one 90 stone; this had 88lbs. in the flea. Mr. PARKHURST ELLIOTT, one 80 stone; and Mr. ANTHONY WIDDEN, one 99 stone. Mr. STENING, one 85 stone. Mr. PRYDE, at Cranley, one last year 91 stone; and several more that weighed between 70 and 80 stone, which we take no notice of. The age of the hogs I suppose may be about two years old.

'I am, &c.

'JAMES PUTTOCK.

'*Rudgewick, Nov. 28th,* 1796.'

In order to discover the weight of the four quarters of any hog, weigh it alive, without fasting it, and for store hogs, multiply that weight by the decimal ..... .55
When the animal is meaty, multiply by 6
Good porkers by ..... .65
Fat hogs by 7
The fattest possible by ..... .75
Then mark off the decimals, and the remainder will be nearly the weight of the four quarters of that hog.

SECT. V.—RABBITS.

THE only rabbit-warren that I know of in the county is on Uxbridge-common. In various other parts of the county, indeed, there are enow of them in the fields to be troublesome to the farmers, who take some pains to destroy

stroy them; but in this they have not altogether succeeded.

The soil of this county is rendered too valuable, by its connexion with London, to be profitably employed in the rearing of rabbits; but in more distant counties, and on very poor sandy land, I have several times had proof that no other stock could have returned so much money for the scanty herbage on which they fed.

There are many places in and about London, where poor people make the breeding and rearing of tame rabbits a very considerable article of profit. They generally feed them with grains (procured from the small-beer breweries), pollard, cabbage-leaves, parsley, turnip-tops, and the refuse of other vegetables, with now and then a little clover-hay, of which they are particularly fond.

When they are of a sufficient age, and in proper condition, they sell them to the poulterers, who supply the tables of their customers with this article of luxury at all seasons of the year, but more particularly when wild or warren rabbits are out of season.

SECT. VI.—POULTRY.

Considerable numbers are raised at the country-houses of most men of fortune, and at the houses of many farmers; but more generally on the corn-farms, where they are useful in picking up corn that otherwise would be lost, and also worms and slugs in the fields near the farm-house. On farms employed purely in the growing of hay, they are less common—sometimes none. As in such cases, the mowing ground comes close to the house, there is no pasture, and it is difficult to restrain the poultry from

'For the small expense, then, of 4½*d.* a poulterer, resident in the vicinity of any great town, and applying to no other business, may rear for sale a chicken, for which he shall receive 1*s.* But the farmer or cottager can provide a similar chicken for the market, at little more prime cost than the value of the egg from which it was hatched. About every house in the country, there is a certain proportion of farinaceous food, which goes daily to waste, if there be not domestic fowls to feed upon it. To the extent of this proportion of food, no chicken kept by a farmer or cottager costs the breeder and keeper more than 1*d.* Would every family throughout these kingdoms, keep constantly just as many fowls as it might thus feed without expense, we should never want abundance of poultry, at reasonable cheapness.

'I have hitherto spoken only of chickens; but older fowls are not less profitable. Any hen, even though fed with food for which money proportionate to its just market value must be actually paid, will, by her eggs, pay, annually, at least three times the cost of her subsistence. A part of the male birds which are not sent to market in the condition of chickens, may be reduced to capons, which you may speedily bring to advantageous sale.

'Why, Sir, the very dung of these creatures is sufficient almost to pay for their whole food. In your garden, you will find it the richest and most exciting of manures for your beds of leeks, onions, &c. &c. Is it not, also, of the greatest utility to tanners and dyers?

'Of all sorts of animal food, the fowl, the chicken, the hen-egg, are the most salutary to children, to women of tender health, to the sedentary, and to the sick.

'The only seasons when dunghill-fowls are troublesome, are in seed-time, and in the beginning of harvest. It may then be proper to put them up in coops; to *shut* them

as it were, with small bags; or, if convenient, to sell off those which might, if retained, and left at liberty, pick the grain from the ears on the sheaves, make lodgements in the standing corn, or scratch up the seeds from the harrowed field.

'Fowls fed as I have directed, may be, at any time, sufficiently fattened for the market, by a confinement of eight days in a dark room, and feeding with barley-meal, with such coarse parts of the flour of wheat as may be bought at one penny a pound, &c. &c.

'You may bring chickens, in sufficient numbers, into the market, without higher expense than I have stated, in every month of the year. And whenever chickens are sold at a higher price than a shilling each, in the London market; there is either the most excessive extortion, or the greatest imposition, or probably both, in fault.

'If gentlemen of estate, or farmers, find their poultry more expensive than I have stated it to be, they may be assured, that it is so to them, only by the waste or fraud of those who feed it.

'I calculate, that, without the expenditure of any thing which would not otherwise go to waste, 10,000,000 of dunghill-fowls might be constantly kept in Great Britain and Ireland. These might supply 12,000,000 of chickens and old fowls for the table, at the average value of fifteen pence each; in the whole, 750,000*l.* sterling. They would afford, also, for the table, 24,000,000 of eggs, worth, at one halfpenny each, 50,000*l.* sterling. Thus the annual produce of our dunghill-fowls alone, might raise provisions to the value of 800,000*l.* from a capital stock of the same value, entirely without expense of labour or food, that does not otherwise go to waste. The facts on which I make this statement, are absolutely undeniable.*

SECT.

SECT. VII.—PIGEONS.

I do not recollect more than one dove-house in the county, and yet many pigeons are kept. A dozen or more pigeons are very commonly to be met with at a gentleman's villa, in the gable end of a stable, or in an empty wine-pipe set upon a post, fifteen or twenty feet high, which preserves them from vermin, and in some sort from being stolen. A few are likewise kept by many journeymen tradesmen, in the character of pigeon-fancyers, in every poor part of London, and in all the other towns and villages in the county, which must make the number in Middlesex very considerable. Their merits, however, in an agricultural view, are very problematical.

SECT. VIII.—BEES.

There are no bees of any consequence kept in the county. We rarely see a hive at a farm-house, and perhaps not ten cottages in the county have any. It is lamentable, that these most valuable insects should be so much neglected. They are probably not kept to one hundreth part so many as they might. Every farmer and every cottager too, ought to be furnished with a few hives.

If I can trust my own observations, bees are kept in greater numbers in the wild and poor parts of England, than in the well-cultivated and rich districts; but they might, and ought, to be found in all. Cottagers might pay their rents from the produce of their bees, which require very little attendance, and less provision. Their whole increase, wax and honey, is very nearly net profit; and

nd they are also supposed to be very serviceable in promoting the increase of beans, pease, &c.

Judging from the great number of hives which I have een in the gardens of poor people in distant counties, I hink it not a very difficult matter for a prudent cottager o raise and keep a stock of bees, whose produce would e nearly equal to his own earnings.

These observations on bees are corroborated by Dr. DOUGLAS, in his Report of Roxburghshire, page 184.

CHAP. XIV.

RURAL ECONOMY.

SECT. I.—SERVANTS, LABOURERS, HOURS OF LABOUR.

IT is not generally the interest of a farmer, to make the most he can of his land, but rather to make the most of his labourers. It may be easily conceived, that, to make land bear the greatest crops which are possible, may be attended with such an expense in labour, as to render so perfect a system unprofitable. Consequently every considerate farmer always has been, and for ever will be, obliged to adopt a practice below perfection, so far as may be necessary to secure the expense of labour being returned with profit. To keep a farm particularly neat and clean, may

may be attended with an expense equal to one-third of its annual rent, in extra labour; which cannot repay so many shillings.

The wages most generally paid to ordinary labourers in husbandry in this county, is ten shillings a week during the winter half year, and twelve shillings a week during the summer half year; but on most farms, there is one handy, confidential workman, at twelve shillings a week the year round. Those who are only employed during hay-time and harvest, are paid fifteen shillings a week; they are occasionally allowed beer, and sometimes a dinner, which makes it equal to their being paid twelve shillings a week the year round.

In summer, the hours of labour are from six o'clock in the morning till six o'clock in the evening; and during the winter months, from light till dark: but half an hour of rest is always allowed at breakfast, and an hour at dinner.

A great deal of labour, perhaps a moiety or more, of the whole, is done by the piece. Here follow some of the prices:

Mowing grass for hay, from 3*s*. to 6*s*.—average 4*s*. per acre.

Mowing, making, stacking, and thatching, teams and straw included, per acre 20*s*. to 30*s*.

Mowing clover the first crop, 3*s*. per acre.

Ditto, the second crop, 2*s*. 6*d*.

Mowing barley and oats, from 2*s*. 6*d*. to 3*s*. 6*d*.—average 3*s*.

Hooking pease, from 3*s*. to 5*s*.—average 4*s*.

Ditto, or mowing, tares, 5*s*.

Reaping oats, 8*s*.

Bagging wheat and rye, from 10*s*. to 18*s*.—average 12*s*.

Ditto beans, from 6*s*. to 9*s*.—average 7*s*. 6*d*.

The

The prices vary according to the bulk of the crop, whether it be standing or lying; and also in proportion o the distance from town. The said prices include the alue of the usual allowance of beer, and also the labour f binding the crop into sheaves, and setting them into hocks, which two last operations are done in a very loose lovenly manner. By bagging, the straw is cut more losely to the ground, than is possible to be done by hand-reaping. It is performed in about the same time, and procures as much more straw as is worth about 7*s.* per acre.

Much thrashing is done by the day; more by the quarter, and some by the truss. These various methods are resorted to, in order that the labourer may be well paid, the corn clean thrashed, and pilfering prevented—but without effect.

Oats and barley are thrashed at per quarter 2*s.*

Beans and pease, at ditto 1*s.* 6*d.*

Wheat and rye, at ditto 4*s.* or sometimes at 2*d.* per ss.

Tares 4*s.*

Straw of every sort, is weighed and bound at 1*s.* per ad.

Hay is cut, weighed and bound, at from 1*s.* 8*d.* to 2*s.* d. per load: a quick hand can bind two loads per day in summer.

Turnips are hoed the first time, per acre at 7*s.*

Ditto the second time, 5*s.*

Nurserymen are said to have their labour done cheaper than the farmers and gardeners.

The number of *women* (mostly from North Wales) ho are employed by the farmers and gardeners round ondon, during every summer season, in weeding and aking hay, in gathering green pease and beans, in pick-

ing fruits, and carrying strawberries and other tender fruit to market, is astonishing. Their industry is unequalled in Britain, or perhaps in the world. The fruit-women will labour several hours in the garden, and go to and from the London markets twice a day, though at from four to seven miles distance.

Their ordinary hours of labour are from eight till six, for which they are paid one shilling a day in summer; and from eight till dark for ten-pence in the winter.

Their working so much in the open air, gives them a hale, brown complexion, the sure index of good health: just the reverse of which, are the complexions and health of those women in other counties, whose occupation is knitting, or lace-making.

Fruit is gathered by measure, and carried to London by the journey.

Green-pease are gathered at from 1*s.* to 1*s.* 6*d.* per sack, according to the size of the pods, and the abundance of the crop.

Beans at half the said price.

'On the whole, it cannot be said that the price of labour is high, for a county in which the metropolis of so great an empire is situated.'

Since the former impression of this work, when the foregoing prices were paid, the advance has been about one-third.

One great grievance which the industrious poor labour under is, the imposition of *the lowest shop-keepers*, of whom they (the poor) are, from local situation, obliged to buy their provision. In the article of vegetables, such dealers *treble the market price*. Another great evil is, that many of this class of shop-keepers also deal in *spirituous liquors, scandal, and bad advice.*

The

The increasing number of public-houses* is equally to be deplored. There the poor and thoughtless are irresistibly tempted to squander their money, in bad beer and spirits, to the manifest injury of their constitution; whereas a substantial meal at home, with a little good ale, would ensure that health and vigour so essential to persons who must earn their bread by the sweat of their brows.

I cannot here omit to mention, that *the increase of public-houses is more ruinous to the lowest orders of society than all other evils put together.* The depravity of morals, and the frequent distress of poor families, if traced to their true source, would generally be found to originate in the public-house. On the contrary, where there is not such a house in the parish (and some such parishes there still are, though in distant counties), the wife and children of the labourer, generally speaking, enjoy happiness, compared with those where many public-houses are seen. They are also less disposed to deceive and pilfer; are better clothed, more cleanly in their persons, and agreeable in their manners.

The labourers of this county are ruined in morals and constitution by the public-houses. It is a general rule, that, the higher their wages, the less they carry home, and consequently, the greater is the wretchedness of themselves and their families. Comforts in a cottage are mostly found, where the man's wages are low, at least so low as to require him to labour six days in every week. For instance, a good workman, at nine shillings per week, if advanced to

* The number of these houses is wonderfully increased in this county, and in Surrey, by reason of many of the brewers and distillers being in the commission of the peace.—*J. M.*

Public-houses, their pernicious effects on labourers and others—see Gloucester Report, p. 25.

twelve; will spend a day in the week at the ale-house, which reduces his labour to five days, or ten shillings; and as he will spend two shillings in the public-house, it leaves but eight for his family; which is one less than they had when he earned only nine shillings.

If by any means he be put into a situation of earning eighteen shillings in six days, he will get drunk on Sunday and Monday, and go to his work stupid on Tuesday; and, should he be a mechanical journeyman of some genius, who by constant labour could earn twenty-four shillings or thirty shillings per week, as some of them can, he will be drunk half the week, insolent to his employer, and to every person about him.

If his master has business in hand that requires particular dispatch, he will then, more than at any other time, be absent from his work, and his wife and children will experience the extreme of hunger, rags and cold *.

The low *inns on the sides of the turnpike-roads*, are, in general, receiving houses for the corn, hay, straw, poultry, eggs, &c. which the farmers' men pilfer from their master.

Gentlemen's servants are mostly a bad set, and the great number of them kept in this county, is the means of the rural labourers acquiring a degree of idleness and insolence, unknown in places more remote from the metropolis.

The poor children who are brought up on the borders of commons and copses, are accustomed to little labour, but to much idleness and pilfering. Having grown up

* 'If greater wages are given, they will be given for expenses in articles widely different from the necessaries of life—they will be given for the encouragement of idleness, and for the increase of the excise revenue. Idleness is the root of all evil—articles of excise are the moisture which nourishes that root.'—*Ruggles.*

and

and these latter qualities having become a part of their nature, they are then introduced to the farmers as servants or labourers, and very bad ones they make.

The children of small farmers, on the contrary, have the picture of industry, hard labour, and honesty, hourly before them, in the persons of their *parents*, and daily hear the complaints which *they* make against idle and pilfering servants, and comparisons drawn in favour of honesty. In this manner honesty and industry become, as it were, a part of the nature of such young folks. The father's property is small, and his means few; he is therefore unable to hire and stock a farm for each of his children; consequently they become servants on large farms, or in gentlemen's families, and in either situation, are the most faithful part of such establishments.

'During the American war (says Sir WILLIAM PULTENEY), the interruption given by our cruizers to the trade of that country, and other circumstances, prevented the Americans from procuring supplies of molasses for their distilleries; and a distress was experienced, particularly in harvest time, for the want of rum to mix with water, which was the drink of their labourers.

'It is known that cold water is dangerous, when used by persons heated with labour, or by any severe exercise; and yet it is necessary to supply the waste by perspiration in some mode or other. When rum or wine is added in small quantity to water, it may be used, even if cold, with little danger; it would, however, be safer if a little warm water were mixed.

'Dr. RUSH, of America, after making experiments, recommended in a publication, that instead of rum, which could not be had, the labourers in harvest should mix a very small proportion of vinegar with their water. Some years after, in a second publication, he mentioned that

the practice had been adopted, and had succeeded even beyond his expectations; indeed so much so, that in many places vinegar was continued to be used, though rum could easily be had.

'He accounts for the preference of vinegar to rum in this manner. Severe labour or exercise excites a degree of fever; and the fever is increased by spirits, or fermented liquor of any sort; but vinegar, at the same time that it prevents mischief from drinking cold water, during the heat and perspiration occasioned by exercise, allays the fever; and the labourers found themselves more refreshed, and less exhausted at night, when vinegar was used instead of rum.

'I have forgot the proportion of vinegar, but I think it was not more than a tea-spoonful to half a pint of water.

'I dare say the works of Dr. RUSH may be found in London, from which a more correct account of this very important matter may be extracted.

'The discovery was not altogether new, for the Romans used vinegar, to mix with water, for the drink of their soldiers.—*Copied from a MS. paper of Sir WILLIAM'S.*'

Mons. DENON, a celebrated French draftsman, who accompanied their army while it was in Upper Egypt, experienced the advantage of vinegar in that burning climate, which he relates in the following manner: 'I cooled the heat of my blood with vinegar, which I mixed with water and sugar, and drank of it largely.'

That quality of water, which produces the ill-effects above described, to persons drinking it cold, when under any considerable degree of perspiration, may probably be corrected by the addition of skim milk. The labourers in some districts of the kingdom, during harvest, make use of no other beverage than milk and water, which is fat

to allay the fever, and quench the thirst, much more than beer. At the same time, the labourers are glad when they can procure ale or beer, though they confess that they are much sooner thirsty after drinking either, than they are after drinking milk and water.

The Legislature, in 1436, enacted that no servant in husbandry, or common labourer, should wear any cloth of above the price of 2*s*. per yard: that sum was nearly equivalent to the value of two bushels and a half of wheat, or 15*s*. of our money. By the same law they were restrained from exceeding the price of 14*d*. a pair for hose: that sum was nearly equal to the value of one bushel and a half of wheat, or 9*s*. of our money.

It is obvious, that this law was intended to restrain them from wearing their former more expensive dress of cloth at 16*s*. or 18*s*. a yard, and hose at half a guinea a pair.

The case of these persons is so much altered for the worse, since the third of EDWARD IV. that at this time about one half of their whole number have neither cloth nor coat of any kind. Their hose cost them about 2*s*. a pair, and a dirty smock frock covers the few rags they wear.

In the great towns, every poor man's dwelling is encircled by chandler's-shops, porter-houses, gin-shops, pawnbrokers, buyers of stolen goods, and prostitutes: from these he hardly can escape; from these, aided by the contaminating effects of crowded manufactories, he never does escape; they certainly ruin the morals of his whole family; the contagion spreads from families to cities, and from cities to the empire. Our labourers being reduced, by these means, to their present wretched condition, are become, as might have been expected, dangerous to their employers, which induces the farmer

to convert his arable land into pasture, in order to do with as little of their assistance as he possibly can: this drives them more and more into the towns in search of work; and in that manner, manufactories and vicious habits successively increase each other. By a system like this, the people of this nation are progressively advancing into large manufacturing towns, which have the baneful effect of destroying the moral principle, as well as the lives of the inhabitants.

The family of every labourer in this county drink tea; many of the women do so three or four times every day; this they do at an expense which is too great for any moderate price of labour to pay. Most of them might grow herbs fit for the occasion, in their own garden; and such of them as have not that advantage, might do so in pots, placed in sheds and spare places, in sufficient quantity to supply their family: others of them might gather herbs in every lane and hedge-row near their cottage, without even the trouble of cultivation. In one or other, or in any of these ways, herbs may be obtained which would not cost any thing, capable of yielding an infusion as agreeable to the taste, at least as nutritious, and perhaps more wholesome, than the tea of China. It is evident this would be a great advantage, in the present state of things, to such poor men as would adopt it; yet there are no persons who avail themselves of it, or any such like economical plan.

The labourers near London provide for themselves, and every branch of their family, the very best wheaten bread, and the richest new milk cheese: this may be right as to the man who labours, and wrong as to some part of his family. But they are always wrong in spending from five shillings to half a guinea every week, in the useless articles of tea, beer, and spirituous liquors. These things are

unnecess-

unnecessary, as an infusion of the most common English herbs (even sweet hay, that has not heated much in the stack) would answer the best purpose of common tea; and the others are useless, because a similar infusion of herbs, grain, or meal, may be prepared, which would answer every intention (except intoxication) better. Corn or pulse might be highly dried, and then ground imperfectly, and used in the manner of either tea or coffee; or on being ground fine, it might be used as cocoa or chocolate, or be made the principal ingredient in water-gruel, milk pottage, thick milk, furmity, barley broth, and animal broth. An infusion of tea, seems to be the least proper for the breakfast of a labouring man, of any thing that can be contrived.

The industrious poor of England are not distressed by the high price of provisions, but by the same cause which distresses many persons in every class in society; namely, by indulging themselves in articles that are only to be obtained at an expense which the parties cannot afford. After what has been said, I shall take it for granted that foreign tea, beer, and spirituous liquors, are unnecessary; and should it be further admitted (and I do not know any sufficient reason why it should not), that one moiety of the earnings of the labouring poor is expended for these unsubstantial articles, it would follow, that they might be as well supported by expending only one half of their present earnings. The other moiety, if properly secured and improved, would accumulate, and become an ample provision for all the accidents of life and the infirmities of old age.

The high value of our landed estates depend very much upon the low price of labour: if the farmers could have their work executed for one moiety of the present cost, other things remaining the same, it would enable them to pay a much

a much higher rent for their land. Supposing the labour of land to be 20*s*. an acre, in case this could be reduced to 10*s*. gentlemen might then add 50 per cent. to their rentals, and the farmers could pay such increased rent, with more convenience to themselves than they can pay their present rents at the present price of labour. The rent of land is about 14*s*. an acre; if the price of labour could be lowered 10*s*. the farmer, by adding 50 per cent. to his rent, would pay his landlord 7*s*. and increase his own profits 3*s*. On the other hand, if, by any means, the price of labour should be increased from 20*s*. to 34*s*. per acre, the rent would be absorbed in the price of the labour, in which state of things the landlord would be unable to procure any rent. The present price of labour, and rent of land, is as much as the farmer can afford to pay; increasing the labour at once, so much as to be equal to the present labour and rent, would reduce the rent to nothing.

It seems to be evident, that an addition to the present price of labour of about 70 per cent. would annihilate the rental of land. Are the advocates for increasing the price of labour, aware of the evil tendency of their arguments? have they contemplated the distress which would take place, if the land should not produce any rent?

Advancing the hire of labour, without, at the same time, increasing the price of the produce of land, would create a struggle, of short duration, between the landlords and the farmers, which would reduce the former to farmers, and the latter to labourers. The labouring class would be inordinately increased in number, and the work to be done greatly reduced in quantity. They would be employed two or three days in a week; this would create a competition among the labourers to obtain constant work, which could only be done by working for less money

money than usual; the price of labour would fall greatly below what it is at present, the land would be imperfectly cultivated, and the agricultural part of the nation would be thrown some hundred years back.

Every advance in the cost of agricultural labour, must be paid by either the community or the landlords. If grain and animal food are made to advance in price, in order to enable the farmers to pay additional wages to their labourers, it becomes a tax on the community, and to which those identical labourers contribute. If the price of grain and animal food should continue stationary, and labour should increase in price, it will infallibly occasion an [illegible] deduction in the rents.

It is [illegible] importance to the landed interest, that the labourers in agriculture should be fed at a very low expense. Any material increase of the wages of labour can only be made, without doing great injustice to the landlords, by a proportionate advance in the prices of grain and cattle.

I should feel much satisfaction at measures being taken to increase the price of labour, and ameliorate the condition of our workmen, if it could be done without greatly injuring the country, and particularly, if it could be accomplished without any material interruption to the progress of science, of arts, and of commerce. But the success of agriculture, manufactures, and commerce, all depend upon the price of labour being low, even very low; in order that our arts and our commerce should be highly successful, the price of labour should be low as possible.

The circumstances of the country have of late made greater calls than usual on the labouring class; the consequence has been, what under similar causes always will be, an advance in the wages of labour. At the former price

price of corn, that would have lowered the rent of land, which would have fallen exclusively on the landed interest; therefore, to prevent so considerable an inconvenience, the corn laws were altered in such a manner as to allow the price to rise.

For the diet of servants in husbandry, see the following section.

SECT. II.—PROVISIONS, AND THEIR PRICES.

Bread throughout the county of Middlesex, is at the same price as in the city of London. In the vicinity of the metropolis, every kind of *butcher's meat* is equally dear, or rather more so, than in the London markets. In the more remote parts of the county, and in the market-towns of Uxbridge and Brentford, pork, poultry, eggs, vegetables, and milk, are something under the London market price.

The whole sticking of beef, in 1794, might have been contracted for by the year at 2½*d.* per lb.; though now (1805) it is advanced to 4*d.* per lb. Rump steaks, which were then sold at 8*d.* are now 1*s.* per lb. Boiling and roasting pieces of beef, weighed together, which were, at the former period, 5*d.* are now 9*d.* per lb. Mutton is nearly at the same rate as beef. House-lamb is from 1*s.* to 2*s.* 6*d.* per lb. Grass-lamb 1*d.* per lb. higher than mutton. Veal is 2*d.* per lb. higher than beef; and pork a halfpenny or penny per lb. higher than veal.

The prices of meat are at the *lowest* from Michaelmas to Christmas; and at the *highest* about March or April.

Vegetables

Vegetables are uncommonly cheap at the first hand, in he markets; but the distance at which the great bulk of he inhabitants reside from the markets, makes it necesary for them to buy these articles of the retailers in their wn neighbourhood, at about three times the original ost.

For instance, turnips—an acre of good turnips are sold o the cow-keeper by the farmer for ten guineas, which roduces five of their waggon-loads. The same crop produces fifteen market cart-loads, which the farming gardener sells at market for three guineas each, or forty five uineas for the whole. The retailers, out of this quantity ake up as many bunches as, at five-pence each, will produce 135*l.* This the consumers are paying the enormous um of 135*l.* for what the farmer sells at ten guineas, and he gardener at forty-five guineas.

The *farmers* of this county live, as they are entitled to o, as well as any other set of men of the same fortune.

The *servants* who are boarded by the farmers, frequently nsume more animal food than their masters. There is o certain rule, but perhaps something like the following routine may be near the truth, viz. bread, cheese, and at pork for breakfast; coarse joints of beef boiled, with abbages and other vegetables, or meat pies, meat puddings, &c. for dinner; cold pork, bread and cheese, &c. or supper; and with every meal small beer.

It is evident the expense of such a diet must be very onsiderable; and the waste which the servants of this ounty make is shameful.

This, together with their rude manners, induces most armers to pay them board-wages, especially as this mehod greatly lessens the trouble of the mistress, and female ervants of the house. They will then eat fat pork, with read and cheese, three times a day; but when the farmer boarded

From				Chaldrons	
March 1,	1795,	to March 1,	1796,	928,743	and
—	1796,	—	1797,	829,684	—
—	1797,	—	1798,	871,097	—
—	1798,	—	1799,	769,047	—
—	1799,	—	1800,	865,804	—

Average annual importation 821,327

which is equivalent to about one million and twenty-thousand tons.

One bushel weighs about three-fourths of a hun which is 27 cwt. per chaldron. Bad coal is rather he than that of better quality, but the extremes of New coal, are supposed not to differ more than one par sixty.

The price of coal at Newcastle is said to vary from to 17*s*. per chaldron of 52 cwt. which is the measu that town; but as the London chaldron weighs only cwt. the original cost of that quantity, including the fitt fees, is from 7*s*. to 9*s*. say the average is £.0 8

The freight varies between peace and war considerably: I shall suppose it to average } 0 8

	s.	*d.*	
The taxes on coals are, by the 8 of Ann, chap. 4, ...	3	0	
the 9th of Ann, chap. 6, ...	2	0	
ditto, chap. 22, ...	3	0	
ditto 1779 and 1782, ...	0	10	
	8	10	
Metage, ...	0	8	
Orphans' tax, ...	0	6	
			0 10

Carry forward ..... £.1 6

Brougl

Brought forward	£.1	6	0
he tax, late the Duke of Richmond, lighthouses, piers, insurance, discounts, commission, and other incidental expenses, about	0	9	0
he charges on getting a chaldron of coals into the River Thames, amount to about	1	15	0

The price of coals delivered over the sides of the ships the Pool, that is, in the River Thames, during the st five, or more years, has varied from 45*s.* to 65*s.*; by hich they have yielded to the importers a profit of from *s.* to 30*s.* per chaldron. In addition to all which, the nsumers have to pay for lighterage, porterage, or cartge, according to the distance from the river, measuring hen it is done, trimming and in beer, from 3*s.* to 10*s.*: all which ways, exclusive of any allowance for being eated in the measure, they average about 3*l.* per chalon of 36 heaped bushels. The quantity is so great as make the whole cost about two millions three hunred thousand pounds.

Since opening the Grand Junction Canal, many coals ve been brought by it from the pits in Staffordshire to ndon. This commerce increased in the years 1804 d part of 1805, in a very extraordinary manner, and omised to continue the supply of a considerable prortion of the coal used in London. But the coal owners Durham and Northumberland, as well as the persons gaged in the shipping of it, became alarmed at the prosct of losing their monopoly of that trade; and they d address enough to prevail on the Legislature to tax all ch coals as should pass by that canal to London, so much to amount nearly to a prohibition.

There are no natural appearances in this county, that in the least indicate coal, and the flatness of the surface is very unfavourable for discovering the strata, by which alone a sound opinion can be formed, as to the probability of its containing coal, or metallic ore.

They, however, may be hidden in the greatest profusion within the bowels of this county forever, if more effectual trials to discover them, should not be made than have hitherto been, which have not exceeded the depth of the wells.

The position and variety of mineral strata cannot be seen at the surface of any part of this county, as they sometimes may in places that are mountainous, or much divided by running water. These cases, aided by minerals being found in such streams, have been the origin of mining in every country.

It is well known that there is coal under St. Leonard's forest, in Sussex, about thirty-three miles from London; and I have been told of coal having been found near Cranley, at about the same distance.

A canal following the borders of the river Mole, by Leatherhead and Dorking, and through the flat country by Crawley, would open a market for these coals, if there be any worth the labour of raising them; at least until the Legislature might think it advisable to prohibit their being conveyed to London.

CHAP. XV.

POLITICAL ECONOMY;

AS CONNECTED WITH, OR AFFECTING AGRICULTURE.

SECT. I.—ROADS.

THE turnpike roads in Middlesex bear evident marks their vicinity to a great city. Scattered villas, and nteel houses, in the manner of a continued, and occaonally of rather an elegant village, are erected on one, or oth sides of the roads, for five, or seven miles out of ondon. The foot-paths are thronged with passengers, nd the carriage-ways with horses, carts, waggons, chaises, nd gentlemen's carriages of every description.

This county is intersected by the three most frequented urnpike roads in the kingdom, namely, the great western oad, the great north road, and the eastern, or Harwich oad; as also by many others of less note.

Most of the *parish highways* in this county, are supeior to any other of equal extent, that I have ever seen. hey are hard and clean in every sort of weather; so uch so, that gentlemen may ride along them, even diectly after rain, and scarcely receive a splash.

The *turnpike roads*, on the contrary, are, generally, ery bad; although at the toll-gates of this county there collected a very large sum of money, probably, not less han 40,000*l.* a year; a considerable portion of which is nclessly expended in sinking wells, erecting pumps, building carts, and hiring horses and men, to keep the

dust down, by watering, instead of more wisely re
it. By the folly of this practice, the roads are kep
inches deep in mire: whereas, *if they were bush-b*
every windy day or night in summer, and scraped wi
is sludge, there would neither be dust in such a quantit
siderably to offend, nor much of the present obstruction.
present state of these roads, the draught of every
is twice as much as it would be if they were clea
along which it is offensive riding, even in boot
horseman's coat, during half the year. The sludge,
is so very deep all the winter, and so fluid after r
to render it unsafe to meet horses, owting to th
throwing it not only over a horseman's clothes, b
into his eyes*.

The turnpike road from Hadleigh through
Mimms, is insufferably bad, and disgraceful t
trustees.

The Edgware road is of the same description. N
is done towards laying it dry: all is flat, and no m
taken to clear it from dust, which occasions sludg
inches deep after every heavy rain in summer, and
inches all the winter. The fresh gravel is always la
the slop, consequently the first cart cuts in into ruts
it remains so all the year. The only possible means
carriage getting forward, is by keeping in the ruts.
road has been in this condition for many years, to
great disgrace of the trustees, who seem to forget,
the public have a right to require, that the money w
is taken from them at the toll-gates, should be laid
with economy and judgment.

The greater part of the last paragraph was writte

* This is no exaggeration: I have repeatedly experienced the tr
it.—*J. M.*

e year 1798; since which time some progress has been ade towards the improvement of this road.

The road from Tyburn through Uxbridge, is supposed have more broad-wheeled waggons pass over it than any her in this county, or perhaps in the kingdom. Therere, if broad wheels were of much advantage to roads, is would be in high condition, as it certainly is sufficitly rolled; and it has also the advantage of lying on bed of gravel. But these, under the late management, ve been insufficient to keep it in repair.

During the whole of the winter 1797-8, there was but e passable track on this road; that was less than six et wide, and it was eight inches deep in fluid sludge. ll the rest of the road was from a foot to eighteen inches ep in adhesive mud.

This track was thronged with waggons (many of them awn by ten horses, and most of them having broad heels, even to sixteen inches wide) and farmer's sixch-wheel carts, which occupied almost the whole of is confined space. It was therefore with great difficulty, d some danger, that horse-men, and light carriages uld pass.

The road continued in this bad condition during the hole winter half year. No exertions were made towards ansing it, although an expenditure of such a trifle as irty pounds, in the employment of a *road scraper, awn by two horses*, would have kept it moderately clean d dry; and would also have prevented the unnecessary struction of upwards of three hundred pounds worth of terials, that were reduced to powder by being soaked d ground, for six months, in water mixed with broken nts.

The only labourers to be seen on the road, during seral succeeding months, were those of a neighbouring

gentleman; and they were employed in carting the foot-path into his enclosures.

The tolls taken at the gates amount to a very large sum annually; and as nothing has been done towards keeping this road in repair, an inquiry ought to be instituted, as to what has become of the money so collected. I do not mean, in the smallest degree, to insinuate that the treasurer applies the principal to his own use; but the public have a right to expect that the tolls should be lett for the greatest possible sum, and that instead of keeping large balances in hand, the money should be laid out in such a manner as to render the road clean and comfortable.

If the present tolls are insufficient for the purpose of supporting this road in good condition, the trustees ought to apply to Parliament for such an increase as would enable them to make it so. With a sufficient fund, the present intelligent and active treasurer gives me well-founded hopes, that this road will, in a few years, be much improved.

The road from Hyde-park-corner through Brentford and Hounslow, is equally deep in filth.

Notwithstanding His Majesty travels this road several times every week, there are not any exertions made towards keeping it clean in winter. In summer, as much money is laid out in watering the dust down, as would, probably, after the first expenditure in preparing the road, and in erecting the necessary machinery for the purpose, be sufficient to make it as clean as the well-kept gravel-walk of a pleasure-ground, by the easy means of flooding the road with water three or four times a year.

The carriage-way through Brentford is particularly bad; the street is much too narrow, does not easily admit of being widened, and it is always filthy. It is supposed that a new road might be made to pass on the north side of

of this town, in such a manner as to avoid being offended by it; at least this might be done at less expense than would be necessary to widen and improve the present street.

Highgate and Hampstead hills are a tax, of one horse in every team, on the farmers of Finchley and Hendon side of the county, who are obliged to drag every load up either one or other of them.

Keeping the roads in the most perfect repair, is an object of high importance: for, until canals, or inland navigation, become general, the supply of the markets, and the price of every article, will be in proportion to the state of the roads over which they have to pass in their way to town.

Bad roads require a greater number of horses to draw any given weight along them, than would be necessary for the conveyance of the same weight over good ones; which extra-draught must be paid for by increasing the price of the article to the consumer. The same number of horses which, along *bad roads*, could only bring a scanty supply of the produce of the country from a small distance, can, on *good roads*, convey a more abundant supply, and from greater distances: which is calculated to lower the price of the necessaries of life in London, rather *advance* them in distant counties, and have a happy tendency towards *equalizing* the prices between town and country.

To the improvement of roads (compared with the state they were in fifty years ago), may be attributed the present safe, cheap, and expeditious travelling in mail-coaches, in which Britain is unequalled. In the variety of construction, of public carriages for the conveyance of passengers, London excels all other places.

The rate at which the coaches travel, including all their stoppages,

stoppages, is, for the heavy ones, five miles an hour* the lighter, six; and mail-coaches seven. The difference is not occasioned so much by swift driving as by the constant going on of the mails, contrasted with the useless number of stoppages made by the other coaches.

In travelling by any of them, the *advertised fare* amounts to about two-thirds of the *entire expense*. The other third consists of a variety of small expenses and impositions, under the name of gratuities, which are demanded of the passengers in such a way that they in general submit, in order to avoid being grossly affronted†. The whole expense of this mode of travelling is from six-pence to eight-pence per mile each person. The expense of a post-chaise, which will carry one, two, or three, amounts to about two shillings a mile, including hire, turnpikes, postillions, &c.

High hedges and trees adjoining the sides of great public roads, keep them constantly wet and miry; therefore such things should not be permitted, even in pleasure-grounds. But they are not only suffered, in various parts of the county, to grow in the hedges, next the road, but to stand on the borders of it, between the fence and the carriage-way, encroaching on the passage, and dripping over it. Every live hedge adjoining a road ought to be clipped, and not suffered to be higher than four feet six inches. They should be kept down in order to let the sun and wind dry up the wet, which would free the roads from sludge; and also to permit the wind to have a free current, in order that it may blow the dust up, and carry it off as it is formed.

---

* That is, 200 miles in forty hours, and so of the rest.—*J. M.*

† Mail-coaches are much more free from this charge than the others, though the whole expense of travelling by them is rather higher than the rest.—*J. M.*

It

t would be a considerable advance towards obtaining m and hard roads, to get rid of the offending matter a state of dust, as it then occupies the least possible ce, which is favourable to its being removed. A small cel of dust, when drenched with water, becomes a large antity of sludge, and in the latter state it requires much our to clear it away; therefore it is very economical to nove it before the rains fall; and bush-harrows worked ry windy day, is perhaps the most promising method making such clearance.

The dust of these roads consist mostly of horse-dung d pulverized flint. During the early part of every mmer, there are many windy days; on all such, it is ly necessary to raise the dust from the ground, and it may be effectually done by a bush-harrow; in which se it would be blown on to the adjoining land, which it uld manure, without any charge, and the public would benefitted by the removal of a great nuisance.

The sludge with which roads are covered in winter, is e dust of the preceding summer, mixed with water. Without dust there cannot be much sludge, therefore put in the power of the wind to clear the roads of the pulrized matter, and they will be reasonably clean in winter. he lighter particles may be removed in the manner hich I have just described, in which case the water uld not be detained, as it is at present, by the dust, it would run into the ditches, and we should be relieved om what renders the roads so offensive. A liberal use bush-harrows on every suitable day, would remove the st, and prevent the accumulation of most of the sludge; nsequently, in this easy and cheap manner any roads y be preserved moderately clean in every season.

t may be said, this method of cleansing roads from , would be inconvenient to such houses as happen to be

be placed near them: true, but it would only offend any house a few minutes on one day, and that only occasionally; whereas, as these matters are now managed, the inhabitants of such houses are nearly continually annoyed by either dust, or road scrapings; therefore this system of cleansing roads is applicable to all such as are near London, as well as to those which are more distant.

The stony matter in all the gravel pits and rivers near London, consists of flint, which has been broken into small sizes, and rounded by being rolled in water; these are in every possible respect more fit for roads than any other flints. They may be had in almost endless quantity in the bed of the river Thames, where, if the trustees of the roads would resort for them, they would improve the navigation, and avoid spoiling land by making gravel pits.

The treasurer of the Hanworth road has lately been so grossly mistaken, as to fetch large flints from the chalk-hills beyond Croydon, about 15 miles, and break them into reasonable sizes by hammers. This he does at a great waste of expense, as the land on each side of his road affords the same material (flint) without the expense of carriage, and broken by nature into small sizes which are more suitable for the road, and being globular, they are mechanically stronger than any shape which can be given them by the hammer. The treasurer of the Clapham road fetched a thousand loads of flint from a similar distance, then half broke them by manual labour, and spread them on a road at the expense of as many guineas, when it was known that the adjoining closes, as well as the bed of a neighbouring river, contained great quantities of the same material, in a state that was calculated to make a road both finer and more durable.

Every road in the vicinity of London is repaired with the

gravel or stones of flint, which, although it be hard, is so brittle as to be unable to bear any considerable weight without being crushed to powder. The comparative weight which stones of similar size and figure can support without being broken, is the criterion by which to try them. The blow of a hammer is a more effectual method of trying the fitness of stone for the purpose of roads, than the point of a graver. A flint would resist the graver more powerfully than whinstone; but owing to their different degrees of toughness, the latter would support a weight of twenty tons more certainly than the former could one. Materials for the support of great public roads, should be selected from among such substances as are tough as well as hard; for this purpose, horn-blende is supposed to be particularly suitable, to which may be added whinstone, basalts, iron-ore, and all such stones as contain iron, as well as the slag, or refuse of furnaces. Where these cannot be obtained, trial may in some cases be made of refuse granite from the quarries which supply the stone with which the streets of London are paved. In some other places, the harder kinds of limestone, which can only be found in the lower beds of the quarry, can be had, and may be used with advantage. Any, or all these stones, ought to be broken into pieces about the size of hen's eggs, before they should be spread on any road.

Roads regularly formed, and covered with such durable materials (particularly if a cement could be contrived, and were to be applied, of such a kind as would confine them together), and provided with a proper drainage to convey the water off, would in a short time become almost impenetrable to wheels moderately loaded, and they would suffer less than usual from the grinding of wheels more heavily burdened.

With

With regard to the expense of procuring these stones, it cannot be any very serious object in places accommodated with either a salt water, or river navigation, nor to countries where they have had the superior sense to introduce canals; and where the persons concerned are obstinate enough to restrict the introduction of canal navigation, they ought to be compelled, at all events, to make their roads good, and keep them clean: the *former* can only be done by employing such substances as I have described; and the means I have above specified, will ensure the *latter*.

The writers on wheel-carriages usually treat that subject, as if the whole draught were occasioned by friction between the box and the axle-tree. It strikes me, however, in a very different manner: the quantity of friction in all common wheels appears to be of secondary, or even of little consequence.

It will perhaps throw some light on the subject, to suppose the wheels, with the nails of the cart-tire sunk in such a manner as to be even with the outer surface of the tire, to revolve upon polished granite, or iron, and the path for the horses to be a clean road of any firm materials. In such a case, most other obstacles are removed, but the whole friction remains; yet, under these circumstances the draught is reduced to one-fourth, or one-fifth of what it was. The coal-waggons of London carry two chaldrons and a half; these weigh nearly three tons seven hundred weight and a half; to which if we add the weight of the carriage, harness, sacks, and other matters, the amount will be about four tons and a half, which I shall call the entire draught. This is a sufficient load for four very able horses to draw along any road made of gravel; but one of the same animals, would with less labour draw the whole along an iron rail-way. From these premises I conclude,

conclude, that on gravelled roads friction is not more than one-fifth part of the entire draught; the other four-fifths are occasioned by the obstacles of dust, sludge, loose sand and gravel. Hence it follows, that by removing these obstructions, and keeping the roads constantly clean and hard, the draught would be so much lessened as to render the present number of labouring horses unnecessary. I have herein before endeavoured to shew the manner in which the dust and sludge may be prevented from accumulating; or, after it has accumulated, the manner in which it may be removed: permit me in this place to intimate, that the time seems to be approaching, when iron must be made to contribute largely towards the public roads.

I think iron rails, or bars, may be laid along our present turnpike roads, in such a manner as to afford the most convenient track for all heavily-loaded carriages; and this may be done without material inconvenience to those of lighter weight and swifter speed.

The great original expense of making such roads, will be sufficiently counterbalanced by their much longer duration, and the trouble fully compensated by the superior pleasure in travelling over them*.

SECT. II.—CANALS.

THE *River Lea*, on the east, is navigable from the Thames near Blackwall towards Tottenham, about eight miles,

* For the manner of working granite, and the durability of it, see Dr. ANDERSON's Report of Aberdeenshire, p. 29, &c. Dumbarton, p. 9; and let it be remembered what large quantities of it have been used in the paving of London streets, over which, I well know, the draught is less than half what it is on the roads of Middlesex and Surrey.—*J. M.*

[illegible] and runs nearly [illegible] of Tottenham, Ed- [illegible] the whole eastern [illegible] to Hertford on [illegible] This canal is gene- [illegible] concern to its [illegible] being defici- [illegible] any, except [illegible] is a valuable [illegible] another to Ed- [illegible] side of it. [illegible] of Cambridge, and [illegible] more pro- [illegible] that such an [illegible] a much [illegible]

[illegible] called the *New River*, [illegible] of a chalk-hill, [illegible] Ware and [illegible] in a straight line: [illegible] miles from its [illegible] at Bull-cross, [illegible] ordinary cir- [illegible] miles more through East [illegible] a course of [illegible] a large bason. [illegible] pipes, the water is con- [illegible] and the northern environs; [illegible] of this part of the [illegible] and regular supply of clear and [illegible]

[illegible] great quantity of very excellent water [illegible] supplies to the inhabitants of London, it

It also does the same to all such families as live near it, the whole of that distance, and is the chief ornament of the east side of the county. It has, by its beauties and use, contributed greatly to increase the value of all landed property adjoining to, or near its borders, which is now mostly occupied by genteel villas, and pleasure-grounds, to the extremity of the county, and in a much greater proportion than any other part of it. It probably has trebled the value of many thousand acres of land, by its inducing wealthy citizens to become purchasers of the ground through which its waters beautifully glide. To these may be added, the great pleasure it affords to anglers who fish in its streams, and to others in walking on its borders.

By enlarging this canal near Ware, so much as to receive most or all the water which now runs to waste down the river Lea, and gradually reducing it all the way to Islington, and by having proper water-gates to accommodate the occupiers of neighbouring land, many thousand acres might be irrigated between this canal and the river Lea, which river would be a natural and effectual drain to carry off the surplus water.

The Grand Junction Canal, lately finished, passes through a rich corn district near Hanwell, Norwood, Harlington, West Drayton, Cowley, Uxbridge and Harefield, in this county. It is already of great importance to the estates through which it passes, and particularly useful to the market of Uxbridge; and as, by means of other canals, it opened a direct water communication between London and the manufacturing towns in Warwickshire, Staffordshire, and Lancashire, it promises to become the most important inland navigation in the British nation.

	ft.	in.	
The first lock is at Brentford, and the rise is	8	0	
The second at half a mile	7	8	
The third at half a mile further	7	8	
These three rise			8
The fourth is at three quarters of a mile further	7	8	
The fifth adjoining the last	7	8	
The sixth ditto	10	0	
The seventh ditto	10	0	
The eighth ditto	10	0	
The ninth ditto	7	8	
The last six are placed nearly together, and they rise			53
The tenth is at a quarter of a mile, and it rises	7	8	
The eleventh very near ditto	7	8	
			15
			91

From this elevation a side-branch, or canal, has been made to Paddington, level the whole way; therefore, the dock at Paddington is about ninety feet higher than ordinary high water in the river Thames, at Chelsea, or at Westminster.

The twelfth at Cowley, six miles from the last, and rises	6	0	
The thirteenth at Uxbridge, two miles further	5	6	
			11
The fourteenth is at Harefield-moor, and it rises			11
The total rise in Middlesex is			116

Farther

Farther on, the locks are placed nearly half a mile distant from each other.

Time—eight hours to Uxbridge; and six hours on the return.

Vessels of 70 tons have passed; but 60 is the stated size—drawn by two horses.

From Heston to Cowley, a perfect level, the canal is about 80 feet wide; under the bridges only 15; the path 7.—Slopes and banks from 30 to 80, or about 50 feet on each side: together 137 feet wide. The intention was to have forty feet water, and fifty-six feet for the two banks, and a towing-path, or in the whole 96 feet; but the land destroyed frequently exceeds two hundred feet. The cut shewed the soil to be a most fertile loam of from one to five feet in depth, on loamy flinty gravel, six or eight feet; then leaden coloured clay; the timber is mostly elm; there is some oak, but that is mostly pollards.

"The following tolls are payable for passing on the canal.

"Lime and limestone one halfpenny per ton per mile. Cattle, sheep, swine, and other beasts; sand, fuller's-earth, pig-iron, pig-lead, and coal, one penny per ton per mile.—Coke, one penny farthing per ton per mile.—Flint, and other stones, bricks, tiles, slates, iron-stone, and all kinds of manure (except lime), three farthings per ton per mile.

"All other goods, wares and merchandize whatsoever, three halfpence per ton per mile. Fractions of a mile taken for a whole mile.

"In addition to the above, one halfpenny per ton is payable to the company for every article passing from the Thames into the canal, or from the canal into the Thames.

"And a further additional toll of two-pence per ton, is payable to the company for all articles passing upon any part of the varied line of the canal, within the parishes of

Abbot's-Langley, King's-Langley, Watford, and Rickmansworth, in the county of Herts.

"When any goods shall pass any lock at times when the water shall not flow over the waste weir above such lock, the company are authorized to take tolls as under.

"Cattle, sheep, swine and other beasts; sand, fuller's-earth, pig-iron, pig-lead, and coke, three halfpence per ton per mile.—Lime and limestone; coal, flint, and other stones; bricks, tiles, slates, iron-stone, and all manure (except lime), one penny-farthing per ton per mile.—Besides the tolls of one halfpenny and two-pence per ton, for passing to and from the Thames, or upon the variation line.

"25th April, 1796."

Bricks are every where ready (being made near the side of the canal), for supplying its own wants.

The canal is on a very large and expensive scale. The quantity of earth which has been dug and barrowed, is immense; it is also left in irregular heaps, and by that means does a great deal of damage to the adjoining land; though in some places it has been left of a more regular shape, and there the farmers have reduced it to the shape of an inclined plane, ploughed it, and sown it to the top, which materially keeps down the loss of land. It is as wide again at all other places as at the bridges; of course, all the boats that can pass under the bridges have room enough to go by each other on the several parts of the canal.

Since the first edition of this book was published a branch has been made from this canal to Padding[illegible] which, in point of utility, stands vastly higher than [illegible] junction with the Thames. This branch is called [illegible] *Paddington Canal*, and it is on one level from L[illegible] th[illegible]

throughout its whole length, and along the main trunk to Cowley, which is nearly twenty miles. This is a convenience of much consequence so near London. The bason at Paddington is upwards of 400 yards in length by about 30 yards in width; it is situated on high ground, and in a mixed soil of gravel and clay, by which it is as well calculated to aid the commerce of the canal as to supply the west end of the town with soft water. This bason provides about half a mile of wharfing for the landing and boating of goods, which is nearly all occupied with yards and warehouses, enclosed, for the reception and security of merchandize. At this place is also a spacious quay for such craft as are not consigned to any particular person, and extensive market-places for hay, straw and cattle; all which have been occasioned by this canal, and as the place has risen from a grass close to a place of great commerce in three or four years, it seems to bespeak, that within a reasonable time it will become the greatest thing of the kind in Britain. Here are already deposits for wool, timber, coal, lime, coke, ashes, bricks, tiles, manure, and many other things; and from this place London porter is sent by the canal to every town on its borders. These are not the only advantages derived from this canal, for such estates as have been intersected by it, are so much benefitted by a water communication with the metropolis as considerably to increase their owners' rental.

Canals, calculated to navigate much smaller boats than any which have fallen under my observation, even down to ten tons, might be made at a very reduced expense; and after certain leading ones were executed, every man of considerable landed property would find it to be his interest to make a small canal through his estate, at least capable of floating boats of five tons, which would be equally convenient for bringing manure, and to carry away

the produce. In all the marsh and fen districts, most of the present sewers would only want a little cleansing, to fit them for this purpose.

The extension of canals may become a powerful means of promoting general cultivation. Good roads are certainly very essential, and I think canals are at least equally so, in an agricultural view. On the best roads, produce and manure can seldom be carried more than ten miles with profit, at the present price of horse-keep: but *if canals were as numerous as roads, corn, hay, manure, &c. could be sent to every part of Britain* without using more road than the towing-paths, and to ten times the former distance, without increasing the expense.

A general scheme for canals and iron rail-ways would tend to equalize the market price of things, as they would afford a cheap and speedy conveyance of every article that might be too bulky and heavy for stage and mail coaches. The benefit of such a scheme would extend to every part of this island. The inhabitants of London and its environs might be more plentifully and cheaply supplied by canals and iron rail-ways than by any system of gravelled roads. The remoter parts of this, and every other county, would be placed more on terms of equality with those that are near, and every other part of the island might reap advantages which may be slightly mentioned, but they are much too great for calculation *.

The encouragement which has of late been given to the opening new communications through the country, by making navigable canals in different parts of it, tends very

* 'Good roads, canals, and navigable rivers, by diminishing the expense of carriage, put the remote parts of the country more nearly upon a level with those in the neighbourhood of the town. They are, upon that account, the greatest of all improvements.'—*Smith's Wealth of Nations.*

consi-

considerably to facilitate the improvement of waste land, and all poor soils, for they introduce abundance of lime, chalk, marl, and manures, to all places through which they run. Canals and irrigation might be made to contribute towards the cultivating every acre of this island, except rocky ground; and the tops of mountains, and these ought to be planted.

In such a county as Middlesex, the canals are equally beautiful and useful; even the prolonged course of the New River is the means of increasing the beauties of the county.

It is probable that canal navigations will be improved and extended, so as to supply London with milk from more distant places than have yet been thought of for that purpose: it is now brought in carts from distances of two or three miles; it may then be brought in boats from places of ten or twenty miles.

For more reasoning on the advantages which a nation may derive from canals, and for useful hints on making them, see Dr. ANDERSON's Report of Aberdeenshire; and Mr. FULTON's Treatise on Canals.

I shall only further observe on this head, that of two methods of raising money for making canals, that which seems to deserve the preference, is the mode by which turnpike roads are usually provided for, instead of entrusting it to the management of interested companies. The latter method is exceptionable, from its creating a perpetual charge on all goods sent by that conveyance, without regarding the money expended, or the interest it may ultimately produce, which is a very imprudent bargain for the public in this country, where population, trade, manufactures and commerce, are so much on the increase.

Had Blackfriars'-bridge been built over the Thames by an interested company, the toll would have continually

increased; and would probably by this time have drawn from the public thirty per cent. per annum. But, more wisely, it was built by borrowing money at five per cent. all of which has been paid off by the tolls; and the bridge has been free from impost during the last ten or fifteen years. In this manner canals ought to be made, and increasing traffic would soon make them free.

Battersea, Putney, and Kew bridges, were built by interested companies, are created the freehold of the parties, and of course the tolls are a perpetual charge on the public, and increasing annually. On the other plan, these bridges would have been free many years ago.

SECT. III.—FAIRS.

There are about ten fairs held in this county annually at various places, from the beginning of May till the end of November, for the sale of cattle; six for the hiring of servants; and four or more for the sale of toys.

Fairs are of much less consequence to the inhabitants of Middlesex, than they are to such persons as reside in places more distant from London; but even here they are worth preserving: in some other counties they are nearly indispensable. The industrious poor in country places have a little relaxation from labour during the time of the wake, or the fair; the thoughts of the vulgar mirth which takes place on such occasions, serves them for conversation for several weeks, and makes their labour seem the less. A fair seems to be a reasonable indulgence in favour of the country labourers, whose industry feeds all the other classes of society. Such times are also very useful for farmers of every description, to sell, buy, or exchange their

their hogs, sheep, neat cattle, and horses. Many other persons resort to these places for similar purposes, and to all these persons fairs are a great convenience.

Fairs and markets ought to be free from toll. The farmer who takes his cattle and corn to market, is doing the proprietors of the town a favour, which entitles him to receive a reward rather than to pay a fine. Taking goods to market occasions an assemblage of persons who lay out money among the town's-people; thus feeding the inhabitants, and enabling them to support the persons who impose the toll. A thing so odious ought to be abolished, as being unworthy of England in the present state of knowledge.

SECT. IV.—MARKETS.

In the country part of this county, there are nine weekly markets held, namely, at Barnet on Monday morning; at Southall and Finchley on Wednesday; at Uxbridge, Brentford, Hounslow, and Edgware, on Thursday; at Stains on Friday; and at Enfield on Saturday.

At *Uxbridge-market* a great deal of corn is sold, and there is a large public granary over the market-place, for the purpose of depositing it from one week to another.

At *Hounslow-market* there is a considerable show of fat cattle; such of them as are not disposed of there, are sent on to London.

Smithfield-market is famous for the sale of bullocks, sheep, lambs, calves and hogs, every Monday; and again,

again, though in a less degree, on Friday. On the day there is also a market for ordinary horses. T the only public market within the bills of mortalit the sale of live cattle.

The following is an account of the number of ne tle, and sheep, annually sold at this market, fro year 1731 to 1795, being 63 years; which I have ed into seven averages of nine years each, namely,

Years.	Cattle.	Sheep.	
1732	76,210	514,700	
1733	80,169	555,050	
1734	78,810	566,910	
1735	83,894	590,970	
1736	87,606	587,420	
1737	89,862	607,330	
1738	87,010	589,470	
1739	86,787	568,980	
1740	84,810	501,020	
Average	83,906	564,65	
1741	77,714	536,180	
1742	79,601	503,260	
1743	76,475	468,120	
1744	76,648	490,620	
1745	74,188	563,990	
1746	71,582	620,790	
1747	71,150	621,780	
1748	67,681	610,060	
1749	72,706	624,220	
Average	74,194	559,881	
1750	70,765	636,340	
1751	69,589	631,890	
1752	73,708	642,100	
1753	75,252	648,440	

Year.

Years.	Cattle.	Sheep.
1754	70,437	631,350
1755	74,290	647,100
1756	77,237	624,710
1757	82,612	574,960
1758	84,252	550,930
Average	75,851	623,091
1759	86,439	582,260
1760	88,594	622,210
1761	82,514	666,010
1762	102,831	772,160
1763	80,851	653,110
1764	75,168	556,360
1765	81,690	537,000
1766	75,534	574,790
1767	77,324	574,050
Average	83,432	615,328
1768	79,660	626,170
1769	82,131	642,910
1770	86,890	649,090
1771	93,573	631,860
1772	89,503	609,540
1773	90,133	609,740
1774	90,419	585,290
1775	93,581	623,950
1776	98,372	671,700
Average	89,362	627,805
1777	93,714	714,870
1778	97,360	658,540
1779	97,352	676,540
1780	102,383	706,850
1781	102,543	743,330
1782	101,176	728,970

Years.

Years.	Cattle.	Sheep.
1783	101,840	701,610
1784	98,143	616,110
1785	99,057	641,470
Average	99,285	687,588
1786	92,270	665,910
1787	94,946	668,570
1788	92,829	679,100
1789	93,269	693,700
1790	103,708	729,660
1791	99,838	729,800
1792	107,263	752,569
1793	116,488	729,810
1794	109,064	717,990
Average	101,075	707,456

In the above account it may be seen, that the supply has been advancing with some degree of regularity both in the number of cattle and sheep, during the last forty-five years. The number of cattle now sent to market, is more by 26,881, than it was forty-five years ago; and of sheep 147,565. And as it is a matter of general notoriety, that the cattle and sheep of England have also been gradually and progressively increasing in their individual weight; owing partly to the attention paid of late years to the improvement of the breed, and partly to their being much better-fed now than formerly, and indeed much better than they could possibly have been before the introduction of turnips and clover, it is not perhaps an unreasonable, or unfounded conjecture, to suppose that the increase in point of weight, has kept pace with the advance in respect to numbers, during the aforesaid period. If so, it will follow that, including number and weight, the annual increase in fifty years is, in neat cattle, upwards of 72 per cent.

cent. and in sheep near 53. On the whole, I think I can safely affirm, that, including all the other supplies of animal food, and considering that they also, as well as cattle and sheep, come to market much better fed, and consequently much increased in weight, above what they were fifty years ago, the consumption of the metropolis is at this time full one half more than it was then*.

To attempt to state the amount of all the various articles produced from the soil, which are sold in this extensive metropolis, and appropriated to supply the daily wants of the inhabitants, would not only open a field for investigation, far too wide and extensive for the limits of this Work, but might certainly be done to more advantage, should any one have the spirit to undertake the drawing up a particular account of the supply and consumption of London, in all its various branches, such as was given to the world by Mr. MAITLAND, in his History of London, in the year 1725†.

In this place it may be sufficient for me to state, that the annual consumption of London is about 110,000 head of neat cattle, and 770,000 sheep; and to add, that any person, possessing some degree of judgment in cattle, and at the same time the desire of looking at a great variety of

* The following is a comparison between the weight of bullocks, &c. as it was one hundred years ago, and as it is at the present time, viz.

	100 *Years ago.*	*Now.*
Bullocks, at an average, weighed -	370 lbs.	800 lbs.
Calves, ditto - - - - -	50	140
Sheep, ditto - - - - -	28	80
Lambs, ditto - - - - -	18	50

—*J. M.*

† My intention was, to have dwelt more at large on the markets of London; but my application to the Lord Mayor (BROOK WATSON, Esq.) and his officers, procured no information: the former affected want of knowledge; and the latter would not furnish any extracts from their books, without a fee, as well as paying the copying clerks.

live

distances*. The quantity of dried and pickled salmon, of cod, herrings, and shell-fish, is also very great.

Fish brought by water to Billingsgate.

The average of six years, ending with 1785, was	1569	cargoes
Seven years, ending with 1792, was	1971	—
Seven years, ending with 1799, was	1684	—
Twenty years, ending with 1799, averaged	1741⅔	—
The year 1800,	1623	—
The year 1801,	2167	—
The year 1802,	2668	—
The year 1803,	3255	—
The last-mentioned four years averaged	2428	—

The average size of the cargoes of these fishing smacks is said to be about fifty tons. They do not, in all cases, come to market fully loaded, but are supposed to bring such loads as would average rather more than forty tons, which, multiplied by the number of cargoes, shews that about 100,000 tons of fish are brought annually by water-carriage to Billingsgate market. To this quantity add the fish brought by land-carriage, of which I have no information, but cannot suppose it less than one-fifth of what is brought by water. These two quantities being added together, shew that the whole quantity of fish brought to the markets in London, amount annually to about 120,000 tons.

There is also one *Corn-market*, and that is held at the Corn-Exchange, in Mark-lane, principally every Monday, but in a less degree every Wednesday and Friday.—A

* Packed in ice.

great

great quantity of corn is sold in London without being registered by the clerk of the market, and much meal is delivered in a similar manner. I am sorry it is not in my power to add an account of the quantity of grain disposed of in this market; but after repeated solicitations both to the Lord Mayor and his officers, I have not been able to procure such an account, therefore I am reluctantly obliged to content myself with merely stating that such a market does exist, and at which very large purchases are made; but with regard to the extent of such trade, or any other particulars, I must refer my readers to such persons, if there be any such, as are both able and willing to inform them.

The foregoing observations apply to British corn only, as it will be seen in the section on Commerce, that I have obtained returns from the Custom-House, of the quantity of foreign grain entered in the books of that place. The imports of foreign corn exceed the exports in the port of London, on an average of ten years, from 1784 to 1795, by 400,000 quarters annually, consequently the foreign corn sold in Mark-lane weekly, and consumed in and near London, is very nearly 8000 quarters per week; just three-fourths of which are oats.

The *Coal-Exchange* stands in Thames-street, where the great dealers buy and sell. But the consumers are not permitted to buy here, owing to the dealers having obtained a complete monopoly of the market.

The annual quantity sold is about 822,000 chaldrons.

A chaldron of coals, as delivered to the consumer, is thirty-six heaped bushels, but it is a much larger measure between the ship-owner and the dealer, and even to such consumers as buy five or more chaldrons at a time: an al-

lowance is then made in the term *ingrain*, which increases the chaldron to full forty bushels.

For more, see Fuel, page 513.

There are three public markets for *Hay and Straw* in this county, namely, Whitechapel, Smithfield, and St. James's; all of which are held every Tuesday, Thursday and Saturday. London is also in part supplied with the same articles from a market held every Monday, Wednesday, and Friday, in Southwark.

The barracks on Hounslow-heath furnish a ready market to the farmers in that neighbourhood for their hay, straw and oats, as well as a fund from which to obtain a supply of manure. In this neighbourhood some farmers sell their hay and straw to jobbers, who take it at the barn door, alter the weight of the trusses, draw it away in their carts, and re-sell it.

Hay is all sold by the load of 36 trusses, each truss weighing 56lb. except new hay, which weighs 60lb. till the 4th day of September; and afterwards 56lb. only: by which regulation a load of new hay, till the 4th of September yearly, weighs a ton, and after that day only 18 cwt. It is sold daily in large quantities at the different hay-markets in London, Westminster and Southwark; and a regular book is kept by the clerk of each market, for the inspection of the public, mentioning the names of the seller, the buyer, the salesman, and the price of each load*.

The

* This seems to have been intended to secure fair and honest dealing; but it fails, almost entirely, of effecting so good a purpose. The money is made by the salesmen to the clerk of the market, and they generally make it several shillings below what they really sell it for, of which sums they cheat the farmers; for over them the farmers have no other check

t *meadow hay* is principally bought for the gentlemen's saddle and coach horses, at from guineas per load. The more ordinary, by the : keepers, coach-masters, and retailers, at from guineas.

· of *ray grass* and *clover*, mixed, is generally :oach-masters, &c. for ordinary draught horses. and *clover-hay* is generally bought for the

---

: apparent one of going to every buyer to inquire what he and such loads of hay. *This is impossible to be done;* nor would :re it possible. But farther, the salesmen deliver their ac- :nd of the season to the farmer, one, two, or three loads of ıe actual number, which they are enabled to do, by daily ıf hay *to persons who have bespoke it of them, without suffering it rket.* Thus they defraud the clerk of the market of his fee, enter these loads in his book, and the farmer is deprived ce of their having sold his hay.—Hence they regularly some of these loads: in this case *the farmer has no sufficient re- ıction took place several months back—his carter cannot write; his ient; or he has left his place. One or other of these insurmountable ı nine times in ten. The farmer has no other resource, but to submit 'oad or loads of hay.* He may change his salesman annually, in the same manner by most, or all of them. Nor is this ılesmen also impose upon the buyers. Hay is generally ıoms, ostlers, and servants, who are afterwards to take it ve from the salesmen from two to five shillings per load, r allow them either to charge twice the amount in price to ır to take it in kind from the number of trusses. Severe as ıis note may seem to be, it is fully warranted by facts, well and at the Public-office in Bow-street.

ations which I have had with graziers and butchers, leave r mind, of the salesmen in Smithfield being equally censu- he skin-markets they are even much worse. Of the corn- no experience.

:ure is the only power which is equal to providing a re- :vil. I hope such a measure will speedily be put into train f Agriculture, and perhaps *it should be required of the salesman :ensed and sworn, and likewise that they shall give security for ıg their offices.—J. M.*

 brewers,

brewers, distillers, and carmen's horses, for the rack, and for cutting it into chaff, at from five to seven guineas.

The straw from different kinds of grain brought to the London markets, is sold by the load, which consists of 36 trusses, of 36 lbs. each; consequently, the load weighs 11 cwt. and 64 lbs. Wheat straw is generally used in the stables, for bedding of horses.

Rye straw is used by brick-makers, to cover their hacks; by collar-makers, and for packing. Barley straw for packing, and by gardeners. Oat straw is also used for packing; and the winter support of cattle, as saddle-horses in straw-yards, &c. Bean straw serves to litter farm-yards and farmers' stables; Pea straw and tare straw to feed farmers' horses in the stables, and saddle-horses in straw-yards.

There are the same regulations at the different markets with respect to straw as hay, and the price of each sort for some time past, has been from 25s. to 45s. per load.

All the straw which is brought to market, is insufficiently thrashed to clear it from corn: when wheat is at the highest price, and bread scarcely obtainable, the same inconsiderate waste prevails. Something ought to be done to remedy this great evil, for at present the labourer will not thrash the corn wholly out of the straw, no not even when his family are suffering for want of bread.

SECT. V.—COMMERCE.

COMMERCE renders essential service to agriculture, by creating a more extensive market for corn and cattle. It also helps to equalize the produce of farms, and the rent of

and: it places the distant and poor counties more upon ns of equality with those that are rich, or near the tropolis; it also accumulates wealth, and thereby multies labour and increases consumption.

The general tendency of commerce is to increase the sforts of man; for by it, the abundance of one province nade to supply the deficiency of another; and, in like nner, the superfluities of one nation is made to contrie towards the wants of others. In this manner, unreined commerce would nearly banish famine from the rld.

On this subject I shall compress my thoughts into a y narrow compass, by endeavouring to reduce the nparative advantages of commerce with various coun-s into the following principles, which are nearly selfdent. The most valuable commerce seems to be that ich is carried on with our own subjects. Every time a p sails, it gives employment to the value of the whole go, and the freightage of the vessel. When it sails m London to Jamaica, its whole cargo is the produce British labour; on its return from Jamaica, its whole go is the produce of the labour of that island, which ng a British Colony, the produce of *all* its labour is tish property; and every addition to it is an augmenta-t of British wealth, as much as if it was accumulated n English County. A ship sailing from Liverpool to blin with a cargo of English broad-cloth, and return-loaded with Irish linen, gives employment to British ects to the value of both: and, in like manner, every age to and from our own Colonies in any part of the ld, gives employment to British subjects to the amount e of the cargoes and the freightage of the vessels. this consideration is founded the wisdom of planting onies in many different climates.

Secondly, in the commerce carried on between British subjects and those of other nations, we have one half of the advantage, and they have the other; or, in other words, the labour of British subjects supplies the goods which load the ships one way; and the labour of the subjects of such other nations loads them on their return. For so much of this commerce as is carried on in British ships, one moiety is increased by the freightage of the vessels.

Thirdly, in being the carriers for other nations, we are only benefitted to the amount of the freightage of the ships, while they have the more important labour which produces the cargoes. As being merely the carriers of goods produced by other nations, is the least profitable branch of commerce; it would be wise in our Legislators to discourage the latter, in order the more effectually to promote the former.

Tobacco is a considerable article of commerce: we import from foreign nations between eighty and one hundred thousand hogsheads of it annually. The raising this quantity in British colonies, which might be planted on the wastes of Africa, would require the cultivation of fifty thousand acres of land; the doing of which would give employment and support to three hundred thousand additional inhabitants.

Tea is another great article of commerce, which we import from one of the most distant, and unaccommodating nations, to the amount of upwards of twenty-two millions of pounds weight annually. This quantity is very little less than ten thousand tons. It might be grown in a proper latitude, probably on the west coast of Africa, by a British colony, on sixty or eighty thousand acres of land. In its being cultivated, gathered, cured and packed, it would give employment and support to 300,000 inhabitants

tants (our own subjects), and also, to a great number of sailors. This would be more valuable to Britain than having it from China, even under the stipulation of paying for it by the manufactures of this country; but, under the present system of paying for it in a great measure with silver, it is greatly less valuable to us than growing it by our own subjects.

To these may be added *rice*, *Indian corn*, and many other kinds of provision, imported from foreign nations, who are occasionally our enemies, in the whole having the effect of giving employment and support to upwards of one million of the subjects of such nations. It is difficult to imagine any thing more impolitic than the giving encouragement to the population and wealth of other nations, to so great an extent, by buying of them those things which we could, with so much ease and advantage to ourselves, grow at home, or, in our own colonies.

It would be very difficult for the people of Britain to preserve an independent existence without the sailors and shipping which are raised and supported by its commerce; but any large nation may carry agriculture to the utmost degree of perfection without the aid of commerce. Those writers, therefore, who labour to shew that the energies of Britain have been misapplied, in planting and raising colonies beyond the seas, in preference to cultivating the waste land at home, seem to forget that we are placed on an island, the independence of which is supported wholly by the valour of its sailors, and the number of its ships. The arguments of such men would be sound, were they addressed to any second-rate nation on the Continent of Europe, whose independence rests on the number and discipline of its soldiers; but it would be found extremely difficult to defend Britain by similar means. However, we happily have the strongest defence in our sailors and

our shipping, raised and supported by a wisely designed and extended system of colonization. It may be admitted, that without foreign colonies, and with little commerce, we might have brought all our waste land into cultivation; and raising, by that means, a greater quantity of food, we might have had a population at home greatly superior to what we have at present; but it is obvious, that all the means which a high degree of cultivation, and extended population, could bestow on us, would be insufficient, during the present war, for our protection. Colonies abroad, of such number or extent as to give full employment in the way of commerce to a considerable proportion of our home population, seems to be the most effectual method that the wisdom of man can possibly form for the protection and strength of the British nation. As excellent sailors cannot be raised and maintained in greater numbers than are proportionate to the commerce of any nation, our statesmen ought to give such encouragement to commerce, as may be the means of multiplying our sailors and shipping so much as to place us in perfect safety against every possible attack at home, from our most inveterate, or perchance, combined enemies.

The following account and remarks are extracted from Mr. COLQUHOUN's valuable book on Police; which does equal credit to his industry and ability.

'The ensuing abstract of the imports into, and the exports from, the Port of London, is made up from the public accounts for one year, ending the 5th day of January 1795, but differs, with regard to the value, from these accounts; in which the price is estimated on data established many years ago, when the articles of commerce imported and exported were not rated at above half the sum they now fetch, *exclusive* of duty.

'It is therefore to be understood, that the following estimate

estimate is made upon the data of the *present value*, as nearly as it can be ascertained. It exhibits a very astonishing picture of the immense opulence and extent of the commerce of the metropolis; and accounts, in a very satisfactory manner, for the vast resources of the country, which have been manifested in so eminent a degree in the course of the late and former wars.

Names

Names of the Countries.	Value of Imports into London.			Value of Exports from the Port of London to Foreign Parts. British Manufactures.			Foreign Merchandise.		
	£.	s.	d.	£.	s.	d.	£.	s.	d.
Ireland,	2,209,501	3	4	168,687	18	3	914,352	4	4
British West Indies,	6,072,117	5	0	2,249,043	13	11	579,453	6	0
Conquered Islands,	1,226,064	13	8	260,976	0	11	110,817	18	0
British American Colonies,	307,412	13	0	654,842	19	4	251,551	6	2
Guernsey and Jersey,	91,936	1	2	12,001	13	10	21,616	16	8
Gibraltar,	12,947	16	8	83,473	14	11	69,315	2	8
Honduras Bay,	14,696	4	2	2,029	18	11	2,550	16	2
South Fishery,	197,680	8	6	21	6	8			
Asia, including East Indies,	8,916,950	2	10	3,398,680	1	4	185,190	16	0
Africa,	66,013	8	4	90,593	12	9	188,743	16	6
Turkey,	641,860	19	2	32,065	12	0	123,776	7	2
Streights,	8,389	14	0						
Carry forward	£.19,765,570	9	10	£.6,952,416	12	10	£.2,447,368	9	8

Names of the Countries.	Value of Imports into London.			Value of Exports from the Port of London to Foreign Parts. British Manufactures.			Foreign Merchandize.		
	£.	s.	d.	£.	s.	d.	£.	s.	d.
Brought forward	19,765,570	9	10	6,952,416	12	10	2,447,368	9	8
Venice,	82,107	16	0	6,203	17	11	16,305	7	2
Italy,	1,215,012	15	0	80,980	18	9	340,786	0	8
Spain,	1,070,697	18	0	205,096	4	4	265,169	3	4
Portugal,	644,610	3	8	182,780	6	2	119,813	12	6
Madeira,	7,479	16	8	27,998	6	10	6,886	18	2
Canaries,	6,763	19	10	20,116	18	4	377	5	2
France,	130	6	8	3,216	5	3	63,625	10	6
Austrian Flanders,	137,249	5	0	129,413	9	7	887,642	18	10
Holland,	1,203,515	3	6	114,458	3	7	1,968,687	3	4
Germany,	1,089,307	19	4	1,044,634	18	0	6,176,100	14	8
Prussia,	196,657	3	2	54,380	14	0	272,719	17	4
Carry forward	£.25,419,102	16	8	£.8,821,696	15	7	£.12,565,483	1	4

Names of the Countries.	Value of Imports into London.			Value of Exports from the Port of London to Foreign Parts. British Manufactures.			Value of Exports from the Port of London to Foreign Parts. Foreign Merchandize.		
	£.	s.	d.	£.	s.	d.	£.	s.	d.
Brought forward	25,419,102	16	8	8,821,696	15	7	12,565,483	1	4
Poland,	104,978	10	4	7,022	11	10	57,067	2	4
Sweden,	262,727	3	4	33,845	5	6	111,457	14	4
Russia,	1,269,688	9	6	95,519	8	8	491,244	9	2
Denmark and Norway,	166,366	1	0	147,340	5	11	545,509	19	8
Greenland,	26,753	11	2						
United States of America,	811,511	18	8	2,251,280	12	1	429,248	7	8
Florida,	16,239	16	0	38,067	0	3	8,855	0	0
Foreign West Indies,	56,240	2	0	1,767	13	10	60	0	0
Prize Goods,	1,572,868	8	8				included in the account of each country.		
	£.29,706,476	17	4	£.11,396,539	13	8	£.14,208,925	14	6

RECAPITULATION.

		£	s.	d.
The aggregate value of goods imported into London in one year - - - - - - - - -		29,706,476	17	4
British Manufactures exported	£.11,396,539 13 8			
Foreign Merchandize do. -	14,208,925 14 6			
		25,605,465	8	2
Value of goods imported in upwards of 9000 coasting vessels, averaged at 500*l.* each -	4,500,000 0 0			
Value of goods exported coastways, in about 7000 vessels, at 1000*l.* each - - - - - -	7,000,000 0 0			
		11,500,000	0	0
Total amount of property shipped and unshipped in the river Thames in the course of a year, estimated at - - - - - - -		£.66,811,942	5	6

'Besides the numerous small inland cargoes of coals, merchandize, grain, malt, flour, and other articles, laden and discharged in the Thames and the river Lea; and also the tackling, apparel, provisions, and stores of above 13,500 ships and vessels (including their repeated voyages) which lade and unlade in the course of a year, estimated at 3,188,100*l.* more, making in all *seventy millions.*

'It is calculated that above forty thousand waggons, and other carriages, including their repeated journies, arrive and depart, laden in both instances, with articles of domestic, colonial, and foreign merchandize; occasioning a transit of perhaps (when cattle and provisions sent for the consumption of the inhabitants are included) fifty millions more, making together a sum of *one hundred and twenty millions worth* of property annually moving to or from London.

'The resources which can move and keep afloat such a vast

a vast commercial system, have never been equalled in any other part of the world. In this port, the amount has been trebled within the last forty-three years, as it amounted only to one-third of its present extent in the year 1753, and is now equal to three-fifth parts of the whole commerce of England.

CORN TRADE.

The traders in corn in a country town, are but little acquainted with the extent to which this business is carried on in London. *Their* speculations are confined to the supply of a few shopkeepers, or manufacturers; while *ours* are extended to the wants of the nation; and, in its consequences, involves several great questions in political arithmetic; such as the means of increasing population; and, through the medium of a cheap diet, extending the export of our manufactured goods.

Abundance of corn at home would certainly repress, or keep down, the price of it; but this degree of supply cannot be easily provided. To have bread in great plenty, at all times, is, probably, an impossible case. Even on the whole world such a supply would be attended with great difficulty; but on the vastly narrower scale of a nation, it cannot be expected. It is not in the power of man to ward off bad seasons; and on the present structure of *Europe*, a supply cannot, in every case, be expected from thence; therefore, it is to *America* we must look for corn when our own happens to be greatly deficient; and to that country we shall, in time, look in vain; for the population of it is so rapidly increasing, as to promise speedily to overtake the means which it has (immense as they are) of supporting it. It does seem not to be too much to expect of our government, that it should contrive the

means

means of reserving so much corn in every year of plenty, as might, at least, lighten the evils of the following time of scarcity.

As this subject will be more fully elucidated in the section on Population, I shall in this place confine my observations to the following points.

A careful examination of our crops will shew that a time of plenty has been followed quickly by another of scarcity; and our *exports* for two years in succession, with a bounty, have invariably been followed by larger *imports* during the two following years, with another bounty.

The year 1697 was remarkable for plenty, and 1698 and 1699 for scarcity.

The years 1726 and 1727 for plenty, and 1728 and 1729 for scarcity.

The years 1738 and 1739 for plenty, and 1740 and 1741 for scarcity.

The year 1756 for plenty, and 1757 for scarcity.

The year 1766 for plenty, and in 1767 and 1768 we imported 1,300,000 quarters of grain.

In the years 1780 and 1781 we gave, in bounties on exportation, 100,000*l.*, and in 1783 and 1784 we imported 1,500,000 quarters of grain.

The year 1792 was remarkable for plenty, and 1793 for scarcity.

The bad seasons of 1790, 1796, and of 1799, occasioned great distress.

The year 1803 was one of great plenty, and 1804 of scarcity.

The foregoing statement of facts, is more conclusive than a volume of reasoning, against exporting corn after a plentiful harvest; as they demonstrate that the surplus of one year has generally been wanted within the following year. The regularity with which bad seasons succeed those

those that are good, is sufficiently certain to induce men of a provident turn to provide corn when it is cheap, for two years' consumption. I have done this, and benefitted by it; and others have done the same. If this subject was well understood, and made public, the farmers, dealers in corn, and others, would preserve the surplus of one year, and apply it to make up the deficiency of another. This would go a considerable way towards equalizing the price of corn. That there is a very large annual deficiency, is now well known to most commercial men; one of the following tables will prove it to average 1,168,000 quarters of corn: this might be bought in a year of great plenty, with the certainty of making much greater gain than can be done by waiting to buy it after scarcity has shewn itself. For these plain reasons, speculators in corn carry on their concerns to the most advantage by buying very large stocks of both English and foreign grain in times of the greatest plenty: by doing this, and keeping it in warehouses till an appearance of scarcity has occasioned a considerable advance in the price, and then bringing it to market, they become the benefactors of the nation, and, at the same time enrich themselves.

We have been in the habit of paying a bounty, and of employing our fleets in exporting our surplus corn one year, and of paying bounties and merchants the following year, or at the latest in the second year, to import much greater quantities of the same and other grain. Thus our ships are converted into granaries, which float the surplus corn of a plentiful season to the warehouses of our merchants on the continent, where it remains till an unfavourabe season has occasioned a deficiency; and then these very ships and others bring back the same corn for sale to the market it was bought at a year or two before.

I understand there are merchants in London, who are in

in the practice of hiring granaries in Hamburgh, Dantzic, and other places on the Continent, which they can do with as much facility as warehouses may usually be obtained in London. When corn is exportable, with a bounty, these provident men ship it from the Thames to granaries on the other side of the water; where it remains a year or two till the price rises in this country so much as to occasion a bounty on importation; then they re-ship the same corn for the London market, and receive the bounty a second time. This is effected with as little difficulty, and as much certainty, as corn could be moved from London to Sheerness and back, or from one side of Mark-lane to the other. The buying and selling corn is a very profitable speculation, when confined to buying at such times as the prices are low, and selling when they are high; and in the interval preserving it in the warehouses of London. But when, by hiring granaries in a neighbouring peaceable nation, the speculator can add to the usual profits, the amount of one bounty on exportation, and another on importation, his profits become unreasonably high.

In this manner a considerable portion of both these bounties has, for a considerable length of time, been divided among the speculators in corn. It, obviously, can have no such tendency as the Legislature expected would arise from the system of bounties. In case there was no such thing, either on exportation or importation, the same men would buy quantities equally large when the prices were low, preserve it in London till they became high, and then sell it, by which means their transactions would be as well calculated to equalize the prices of grain as they can be under any system of bounty. If the bounty on exportation was with-held, our farmers, merchants, and speculators in corn, would provide granaries, and preserve the abundance of one year toward supplying the

 defici-

deficiency of the following years. These three descriptions of men effect a similar salutary purpose at this time; therefore, there can be no doubt of their being able to continue it, so long as the quantity of the circulating medium shall remain equally considerable. The trade in corn, like that of most other things, would, I think, conduce most to the advantage of the nation if it were left to itself; the higher price of corn in this country, after an unfavourable season, would in all times occasion a supply to be brought from other nations, where it happened to be cheap; to which might be added a bounty on importation in cases of emergency, or when the price of corn should happen to rise above a stated sum.

To which might be added, that we should cultivate and bring into use, every capable inch of the island; for 'the complete improvement and cultivation of the country, most certainly is the greatest of all public advantages. Food not only constitutes the principal part of the riches of the world, but it is the abundance of food which gives the principal part of their value to many other sorts of riches.'—*Dr. Smith's Wealth of Nations.*

But the policy of this country has hitherto been so much the reverse of this, as to make it impossible for husbandmen to provide farms for their children to cultivate; which necessarily drives them into trade, and in that manner represses, or keeps down, the most healthy class of population. It is likewise ultimately the cause of our manufacturers being fed, at a higher price, with the productions of the land of other nations, who are occasionally our enemies, but who have the superior wisdom to raise corn for exportation, and consequently to drain this country of its wealth, to pay them for their labour and profit in raising it.

In a manuscript paper, which now lies before me, Sir

WILLIAM

WILLIAM PULTENEY makes the following observations on the corn laws. Many of the inconveniences to which we may be often exposed from a deficiency of crops, might be prevented by a very simple alteration of the corn laws, namely, that no exportation should be allowed, either with or without bounty, till the month of April: by which means it would be known what proportion the produce of the former year bore to the consumption, and also the prospect of the ensuing crop. If corn was then wanted abroad, our exportations would always produce greater returns, and all intermediate frauds, as to bounties, would be prevented.

In the next place are subjoined some extracts from the parliamentary reports of 1800, shewing the quantity of corn and flour imported into, and exported from, the port of London, and also for the whole of Great Britain, for ten years ending with 1800.

An Account of the Quantity of Foreign Corn Exported from the Port of London during Ten Years, distinguishing each Year.

Years.	Barley.		Beans.		Oats.		Oatmeal.		Pease.		Rye.		Indian.		Wheat.		Flour.		
	qrs.	bus.	qrs.	bus.	qrs.	bus.	qrs.	bus.	qrs.	bus.	qrs.	bus.	qrs.	bus.	qrs.	bus.	cwt.	qrs.	lb.
1785	.....		.....		1005	0	.....		700	0	.....		.....		719	5	.....		
86	.....		42	5	.....		.....		140	4	.....		.....		.....		69	0	27
87	550	0	60	0	955	0	.....		40	0	.....		.....		.....		.....		
88	.....		.....		196	0	.....		25	4	.....		.....		.....		.....		
89	.....		150	0	565	2	.....		473	4	.....		.....		2538	4	1594	2	13
1790	.....		851	2	768	0	.....		.....		.....		5496	4	500	0	5766	1	5
91	.....		743	4	796	4	.....		.....		83	6	509	0	7517	5	804	0	14
92	500	7	50	0	7934	6	.....		349	6	.....		.....		9280	0	100	0	0
93	.....		48	5	2138	6	.....		103	4	498	6	.....		24,069	4	22,337	3	25
94	.....		.....		466	0	.....		137	0	1095	3	.....		56,755	5	12,083	2	1
Total	1050	7	1946	0	14,825	2	.....		1969	6	1677	7	6005	4	101,380	7	42,755	3	11
Average annually	105	0	195	0	1483	0	.....		197	0	168	0	600	0	10,138	0	4276	0	0
These imports amount annually to	29,460	0	5524	0	312,774	0	219	0	6089	0	946	0	727	0	51,457	0	9590	0	0
These exports ditto	105	0	195	0	1483	0	none.		197	0	168	0	600	0	10,138	0	4276	0	0
The imports exceed the exports by	29,355	0	5329	0	311,291	0	219	0	5892	0	778	0	127	0	41,319	0	5314	0	0

An Account of the Quantity of British Corn Exported from the Port of London during Ten Years, distinguishing each Year.

Years.	Barley.		Beans.		Malt.		Oats.		Oatmeal.		Pease.		Rye.		Wheat.		Flour.		
	qrs.	bus.	qrs.	bus.	qrs.	bus.	qrs.	bus.	qrs.	bus.	qrs.	bus.	qrs.	bus.	qrs.	bus.	cwt.	qrs.	lb.
1785....	821	6	4552	6	677	7	4346	7	161	2	3645	5	1021	4	55,763	7	66,650	2	0
86....	122	7	8539	6	.....		8342	6	750	6	3561	2	345	3	78,786	1	115,942	2	0
87....	306	2	8219	7	39	0	8569	3	340	0	4526	1	2215	6	39,062	7	103,964	0	0
88....	5163	1	7987	7	46	2	8412	6	223	2	2237	0	2142	6	18,932	4	40,125	0	0
89....	7486	7	11,888	0	35	0	9914	0	377	0	6882	0	7031	2	5,101	0	78,464	2	0
1790....	391	5	7329	3	.....		8404	5	1819	5	5800	6	47	4	3	4	60,197	0	0
91....	188	0	6038	1	28	0	11,552	1	394	1	4439	0	.....		14,198	0	34,632	0	0
92....	880	5	7340	7	29	0	7418	2	335	7	3283	1	924	3	42,783	2	101,899	2	0
93....	304	4	8265	0	49	0	9747	1	521	7	3150	6	.....		.....		38,758	0	6
94....	308	0	6005	3	60	4	10,362	1	723	3	2575	2	28	0	.....		29,196	3	0
Total	15,973	5	76,167	0	964	5	87,070	0	5647	1	40,100	7	13,756	4	254,631	7	669,829	3	0
Average annually	1597	0	7617	0	96	0	8707	0	565	0	4010	0	1376	0	25,463	0	66,983	0	0

An Account of the Foreign Grain of all Sorts, Potatoes, and Salted Provisions, imported into Great Britain in One Year, from the 26th of Sept. 1799, to the 27th of Sept. 1800.

		Qrs.	Bush.	Qrs.	Bush.		s.	d.		£.
Barley, ...	England,	61,034	0	67,989	0	at	53	11	.....	180,418
	Scotland,	6955	0			at	45	8		
Beans, ...	England,	13,151	1	13,811	7	at	66	11	.....	46,266
	Scotland,	660	6			at	68	5		
Oats, ...	England,	446,712	6	479,321	0	at	38	6	.....	922,557
	Scotland,	32,608	7			at	38	5		
		Bolls.		Bolls of 140lbs.						
Oatmeal, ...	England,	1107		1224		at	68	1	.....	3975
	Scotland,	117				at	35	4		
		Qrs.	Bush.	Qrs.	Bush.					
Pease, ...	England,	16,565	3	19,573	7	at	63	8	.....	63,173
	Scotland,	3008	4			at	69	5		
Rye, ...	England,	148,429	0	149,409	4	at	71	9	.....	582,985
	Scotland,	980	4			at	51	6		
						Cwts.	qrs.	lbs.	Cwts. qrs. lbs.	
Rye-meal, ...	England, ...					20,816	0	15	25,241 3 15 about	40,000
	Scotland, ...					4425	3	0		

		Qrs.	Bush.	Qrs.	Bush.		s.	d.					£.
Wheat, ...	England,	1,032,121	3	1,176,736	$5\frac{1}{2}$	at	106	0	.....				6,072,805
	Scotland,	144,615	$2\frac{1}{2}$			at	83	4					
						Cwts.	grs.	lbs.	Cwts.	grs.	lbs.		
Wheat flour,	England, ...					320,130	0	17	345,590	2	27	about	691,200
	Scotland, ...					25,460	2	10					
Indian corn,	England,	3506	1	Indian meal, ...		34	1	3					
	Scotland,	2372	0	ditto, ...		4281	2	24					
				5878	1				4316	0	0	about	15,000
Rice, ...	England, ...					291,950	0	6	300,693	2	6	about	375,000
	Scotland, ...					8743	2	0					
Potatoes, ...	England, ...					6885	3	9	6893	0	15	about	7000
	Scotland, ...					7	1	6					
Biscuit, ...	Scotland, ...					17	3	11	17	3	11	about	11
		1,913,332	0						682,753	0	0		
Bacon, ...	England, ...					68,034	2	4	68,546	0	0	at 80*s.*	274,184
	Scotland, ...					511	2	16					
Beef, ...	England, ...					132,134	1	0	132,369	2	0	at 80*s.*	586,178
	Scotland, 5670 barrels at 10*l.* and					235	1	14					
Butter, ...	England, ...					225,002	0	12	230,030	2	0	at 80*s.*	920,122
	Scotland, ...					5028	1	27					
Pork, ...	England, ...					102,521	2	0	.....			at 80*s.*	410,086

An Account of the Foreign Grain of all Sorts, Potatoes, and Salted Provisions, imported into Great Britain in One Year, from the 26th of Sept. 1799, *to the 27th of Sept.* 1800.

		Qrs.	Bush.	Qrs.	Bush.		s.	d.		£.
Barley, ...	England,	61,034	0	67,989	0	at	53	11	.....	180,418
	Scotland,	6955	0			at	45	8		
Beans, ...	England,	13,151	1	13,811	7	at	66	11	.....	46,266
	Scotland,	660	6			at	68	5		
Oats, ...	England,	446,712	6	479,321	0	at	38	6	.....	922,557
	Scotland,	32,608	7			at	38	5		
		Bolls.		Bolls of 140lbs.						
Oatmeal, ...	England,	1107		1224		at	68	1	.....	3975
	Scotland,	117				at	35	4		
		Qrs.	Bush.	Qrs.	Bush.					
Pease, ...	England,	16,565	3	19,573	7	at	63	8	.....	63,173
	Scotland,	3008	4			at	69	5		
Rye, ...	England,	148,429	0	149,409	4	at	71	9	.....	582,985
	Scotland,	980	4			at	51	6		
							Cwts. qrs. lbs.		Cwts. qrs. lbs.	
Rye-meal, ...	England, ...						20,816 0 15		25,241 3 15 about	40,000
	Scotland, ...						4425 3 0			

Wheat,	England,	1,032,121	3	1,176,736	5½	at	106	0						6,072,805
	Scotland,	144,615	2½			at	83	4						
							Cwts.	qrs.	lbs.	Cwts.	qrs.	lbs.		
Wheat flour,	England,						320,130	0	17	345,590	2	27	about	691,200
	Scotland,						25,460	2	10					
Indian corn,	England,	3506	1	Indian meal,			34	1	3					
	Scotland,	2372	0	ditto,			4281	2	24					
				5878	1					4316	0	0	about	15,000
Rice,	England,						291,950	0	6	300,693	2	6	about	375,000
	Scotland,						8743	2	0					
Potatoes,	England,						6885	3	9	6893	0	15	about	7000
	Scotland,						7	1	6					
Biscuit,	Scotland,						17	3	11	17	3	11	about	11
		1,913,332	0							682,753	0	0		
Bacon,	England,						68,034	2	4	68,546	0	0	at 80*s.*	274,184
	Scotland,						511	2	16					
Beef,	England,						132,134	1	0	132,369	2	0	at 80*s.*	586,178
	Scotland,	5670 barrels at 10*l.* and					235	1	14					
Butter,	England,						225,002	0	12	230,030	2	0	at 80*s.*	920,122
	Scotland,						5028	1	27					
Pork,	England,						102,521	2	0				at 80*s.*	410,086

						£.
Pork,	Scotland, 2699 barrels,				at 10/.	26,990
		Dozens.	*Nos.*	*Barrels.*		
Tongues,	England,	2040 &	3 &	736¼		18,000
	Scotland,	128 &	10 &	68¼		
Hams of swine,	Scotland, No. 32,					32
Venison hams,	Scotland, 101 lbs.					12
Marrow,	41 lbs.					3

The foregoing articles cost the inhabitants of Britain, in the purchase of them, ... £.11,235,997 To which should be added, the bounty paid on their importation, which was nearly sufficient to make the whole expense amount to the very great sum of about *fifteen millions* sterling.

The hundred weights of meal and roots may be nearly reduced to quarters of grain, by supposing one hundred to equal the produce of three bushels; therefore, multiplying 682,753 cwts. by three, and dividing the produce by eight, gives the number of quarters, 256,032, which being added to the quarters of grain before particularized, namely, 1,913,332, will give us the whole number of quarters imported in one year, viz. 2,269,364.

This great quantity equals the entire produce of about 756,455 British acres of arable land.

SECT. VI.—MANUFACTURES.

AGRICULTURE may be denominated the art of manufacturing the soil, and among all the classes of manufactures, it is entitled to the highest rank; since it not only makes a greater return for the labour bestowed on it, but it is also of the first necessity, the demands for its products being urgent and irresistible. Any other manufactory may be laid down with little inconvenience to the nation, and without occasioning the death of any of its professors; but agriculture must be encouraged, as it affords the only means of increasing the number of our people, and it supports the whole society.

In this point of view, the *seed grain*, amounting to about 15*s.* an acre, may be said to constitute the *raw material.* When the *corn and straw* produced from this seed, are dressed and sent to market, the greater part of it is then fit for consumption, and *may be called a finished manufacture.* The produce of arable land in this county is 10*l.* per acre, from which sum take the said 15*s.* and the remaining 9*l.* 5*s.* is the increased value; that is, equivalent to 1233*l. per cent. on the cost of the raw material.* Corn is still further manufactured into bread, beer, spirits and other things; but, exclusive of such operations as do not depend on the farmer, this is not above the average for the produce of the arable land of this county; and some parts of Surrey, Kent, and Essex, yield in the same proportion.

The *raw material, on an average* of the arable of the whole of South Britain, amounts to about 16*s. per acre,* which is increased in value by labour*, *to* 5*l.*; that is, equal

* At least, in conjunction with the assistance of Nature; but as not one shilling could be procured for the natural products of the world, without the application of labour, the whole may, therefore, be said to be derived from labour.—*J. M.*

to

to 525*l.* per cent.; *at which rate the labour bestowed on fifteen millions three hundred thousand acres, produces a return of* 64,260,000*l. sterling.*

The cattle and implements may, in a manufacturing point of view, be deemed the stock: the amount of which, on the *meadow land* in this county, is about 4*l.* an acre, and the produce 10*l.* The labour and profits of stock, therefore, are 150 per cent. On a farm purely *arable* in this county, the said stock would be 5*l.* and the produce 10*l.* or 100 per cent. There are not any grazing farms in the county; if there were, their stock would be greater, and they would not yield so large an increase.

The farming capital of South Britain is 5*l.* an acre, or 200 millions*; and its annual produce is about 130, that is, 65 per cent. I shall hereafter speak of the division of this sum into labour, rent, taxes, and profit.

ANNUAL PRODUCE OF THE SOIL.

	£.
The arable land in South Britain is supposed to contain 15,300,000 acres, and to produce on the average four guineas each, or	64,260,000
The hop-gardens make returns to the amount of 30*l.* an acre, for the produce of labour, or about	1,000,000
Carry forward, ...	£.65,260,000

* 36 million acres of arable and grass, at 5*l.* is - - £.180,000,000
2 ditto wood, copse, &c. at 3*l.* is - - - - 6,000,000
8 ditto commons, at 25*s.* is - - - - - - 10,000,000
50 thousand acres of gardens, at 100*l.* is - - - 5,000,000
64 ditto hops, and nursery-grounds, - - - - 1,000,000
The whole capital is - - - - - - - 202,000,000
But for even money, say 200 million pounds sterling.

Brou

Brought forward, ...	£.65,260,000
Nursery-grounds produce upwards of 65*l.* per acre. Deduct the raw material, and the produce of labour will not be less than 60*l.* on 10,000 acres, is	600,000
The fruit and kitchen gardens are the most valuable resources for labour, and make the greatest return, probably to upwards of 100*l.* per acre, on an average of Great Britain; but I shall only estimate them at that sum on 50,000 acres, is	5,000,000
The grass land and cyder countries, cultivated in South Britain, make returns to the amount of 3*l.* on twenty millions of acres, is	60,000,000
The commons, eight millions, at 1*s.* 3*d.* an acre, ...	500,000
Total	£.131,360,000

I shall not presume to offer the foregoing statement as one that either is, or can be, made out with accuracy and precision. But, under all the circumstances of the case, I think *I may fairly state the annual agricultural produce of South Britain at one hundred and thirty millions; which must be allowed to surpass all other manufactures that can be brought in competition with it, not only as to the gross amount, but also for its superior usefulness.*

Further, if we suppose that there are two millions and a half of persons employed in agriculture, their average earnings will be, for men, women and children of all ages, 52*l.* which is a sum so much exceeding their expenses,

penses, that it is evident this employment must enrich society: and it is equally clear, that it contributes at once its surplus wealth and population to make up the deficiencies of the other departments both in men and money.

Other manufactures, it must be remarked, cannot support their own population; but, on the contrary, have a tendency greatly to shorten the duration of life. It is therefore to agriculture's healthy sons we must look for a supply to make up the loss experienced in manufactories, in great cities, in commerce, and in war*.

A large manufactory trains the children to profligacy, and fills the neighbouring villages with raggedness and filth, in order that an individual may rise to unwieldy wealth. When these youth are grown to men and women, in case they should then have the good fortune to be employed during peace, or the prosperity of the trade, the first war, or other thing which happens to stop it, deprives the people of work, in which case the women become prostitutes, and the men soldiers, sailors, and thieves. On the contrary, suppose a village to consist of small comfortable cottages, either single or in pairs, and each house accommodated with a garden, and ground sufficient for the

* All the artists, manufacturers, and commercialists of the world, are employed on the produce of the soil, and on that only. The watch-maker and the anchor-smith, the clothier and the lace-maker, the goldsmith and the lapidary, are all, and each of them, equally engaged in one object, namely, that of rendering the productions of the earth subservient to the use and convenience of man. The stock of every warehouse and shop, the furniture of every mansion and cottage; all implements and utensils, may easily be traced to the same origin. Even the books of the scholar, and the ink and quill through whose means he communicates his thoughts to others, are derived from the same source as the material on which the naval and civil architect exercises his ingenuity and skill. The lofty spire and the smallest needle, are both the effects of labour and skill exercised on the soil.—*J. M.*

suppose

support of a cow; these things would at once not only be free from every matter which is offensive in the other, but in their place we should find what materially contributes to ornament and subsistence; how much would it promote the health, morals, and happiness of the people, if the whole population of the poor were thus scattered over the face of a country. This pleasing picture has been partly realized by the benevolent Earl of WINCHILSEA, and certain it is, that his Lordship's example deserves to be imitated by every man of fortune.

It would be a vain, and, in some measure, an useless task, to attempt, in a work of this sort, to particularize, the different manufactures carried on in this county; especially as they are so very numerous, and in their nature so various, that to do common justice to the subject, would require more time and ability than I have to bestow on it. I shall therefore only notice three or four modern ones, that are a little out of the common way, without meaning, in the most distant manner, to derogate from the merits of the rest, as they do not stand in need of my panegyric to recommend them.

At Chelsea, there is established a new and beautiful manufacture of painted silk, varnished linen, cloth, paper, &c. for the hangings and furniture of rooms. The paper, silk, leather, &c. are for the most part stamped: some of the pieces are very highly finished by hand. The linen is painted entirely by hand, which operation is performed by girls from eight or nine, to fourteen or fifteen years of age: at this manufactory about forty such girls, and sixty other persons, have constant employment.

At the same place (Chelsea) there is a manufactory of artificial stone, fire proof earthen stoves, and crucibles; the same person also makes filtering stones, for the purpose of clearing water from its impurities.

In

upwards, and the earthy particles do
greatly superior to the old method of filt
in which it had to pass through a noxio

At the end of Pollard's-row, near t
a manufactory is lately established, for m
flaxen pipe-hose for fire engines, the
ships, &c. They are wove tubular, w
made to any length, and of any diamet
its infancy, and at present employs but

To the foregoing account I shall o
supposed there are eight thousand wa
county, whereof seven thousand are res
of Clerkenwell.

The silk-weavers are probably as m
principally inhabitants of Spital-fields,
Bethnal-green parishes. The poverty a
people at this time (February 1798),
very generally a family in every room
bedding, furniture or clothes. The f
backs comprise the principal part of the

In 1805 and 1806 these people were ge
and that has relieved them from much
may an accession to their labour contin

degree of perfection as far to exceed, in point of e, those made at any other place in the world.

DISTILLERIES.

distilleries are known to give employment to many ;, to render their owners wealthy, and to yield towards the public revenue. Some persons have :d them to have the effect of public granaries, by worked in times of plenty, and stopped when the f corn is high. It must be admitted, that if the 'ere worked or stopped according to the price of hey would contribute the amount of their whole ption towards equalizing its price. That is, when ppens to be at a price materially below par, the ies might, by being fully worked, consume a con- e quantity, which would have a tendency to pre- e price from becoming lower; on the other hand, g the stills on the approach of dearth, would have :ct of increasing the quantity of corn for bread, ressing the price of it. But this trivial good which illeries, under improved management, might do, y more than balanced by the baneful effects of a us liquor, which it is the sole business of this ma- :y to extract from corn.

idea that the distillery takes off any quantity of corn, and in that manner becomes beneficial to ure, is wholly unfounded; as it is capable of 'oved, that this manufactory does not take off any atever which would not be consumed without the . It is very well known, that the population of ion requires more bread corn than is grown in it; equally certain, that if the grain which is destroyed

by the stills was set apart for the food of human beings, there would be such an increase of people, as to be exactly equal to all that could live on such a diet. Therefore every such a small quantity of gin as is usually made from ten or twelve bushels of barley, deprives a human being of bread, and in that manner becomes the certain cause of his death. The distillery, in the aggregate, consumes annually five hundred thousand quarters of corn. If such a poisonous manufactory were annihilated, this quantity of corn would be converted into bread, and that would increase the population of this nation upwards of three hundred thousand souls, whose joint labour and military strength would render essential service to the nation.

'The corn distillers cannot work without raw grain, as the expense of the tun, with all malt, and the duty thereon, would far exceed the sum which the produce would sell for, and the work would be no better.

'It is a mistake to suppose the corn distillers have bottoms to throw away; there being no such thing. The beer brewers and the *compound* distillers have frequently bottoms to dispose of.

'The produce in gallons, and the sum afforded to the revenue by the distilleries, in 1795, were as under:

Names of Distillers.			*No. of Gall.*		*Revenue.* £.	s.	d.
1.	Messrs.	Hatch	3,362,739	.....	119,448	5	[illegible]
2.	—	Metcalfe	3,201,103	.....	117,691	16	[illegible]
3.	—	Cook	3,261,638	.....	116,221	11	[illegible]
4.	—	Gosse	2,394,398	.....	87,428	16	[illegible]
5.	—	Johnson	2,283,984	.....	81,548	10	[illegible]
6.	—	Bush	2,176,561	.....	79,685	1[illegible]	[illegible]
7.	—	Hodgson	2,213,311	.....	80,658	1	[illegible]
8.	—	Liptrap....	1,738,934	.....	61,410		
9.	—	Roberts	1,920,391	.....	69,530		5
10.	—	Booth	1,349,933	.....	48,277		5 1
							Tod

Total 23,902,992 gallons, which are equivalent to 14,228 tons, that pay an annual revenue of 860,000*l.*

These distilleries also fatten about 50,000 hogs for bacon, in the doing of which, they increase the value of them four pounds each; this amounts to 200,000*l.* Revenue and hogs pay annually 1,060,000*l.*

The rest of England and Scotland are supposed to yield an equal revenue and quantity of bacon, namely, 1,060,000*l.*

It redounds much to the credit of Mr. MAN, of Bromley, in this county, who about the year 1789 began to give distiller's wash for the fattening neat cattle, which so evidently improved them, that he soon tried mixing other food with the wash, in order to induce the cattle to eat more in quantity, to consume it in less time, and to increase the number of hours for them to rest. This succeeded in so extraordinary a manner, that he has extended his buildings, and increased the number of his bullocks, so as to be able to feed a thousand at a time; and he frequently has nearly that number in his stalls. I understand he can in this manner fatten between four and five thousand oxen and cows annually. At this time (1803), he cuts into lengths of an inch and an half, or two inches, at the expense two guineas, thirty-five loads of clover hay per week, which is immediately put into a large cistern, containing a considerable quantity of the foregoing wash, where it steeps, and with the contents of this cistern, probably in a state of fermentation, his cattle are served by pailsful poured into their mangers. This nutritious mess is thus given to them four times every day. After the lapse of a few days at first, they greedily devour this mixed food, and during the rest of their time they amuse themselves by eating a small quantity of the best hay,

chewing the cud and lying down, by which system they fatten in the most speedy manner.

During the three or four first years of this practice, Mr. MAN obtained the wash for nothing; the secret then began to extend, and the wash is now fetched from the distilleries to all the environs of the town, and even to the distance of ten or fifteen miles, although it is now sold at two shillings and sixpence per butt. The whole quantity of wash made at all the distilleries in and near London, used to be drained into the river as of no value: it is now sold, and so desirous are the cow-keepers and cattle-feeders of obtaining it, that carts to the number of ten or twenty at a time, may be seen waiting to be filled in turn, when the wash is turned off.

The distillers' wash at this time probably increases milk and beef in London, besides paying for all the hay and other things eaten with it, to the annual amount of 180,000*l.*

The whole of these articles amount annually to 2,300,000*l.*

The quantity of gin particularized in the foregoing account, is rather less than what is annually consumed by the inhabitants of Britain. In the hands of a wise physician, a small quantity of it might be usefully employed; but in the manner it is now taken by low people, it destroys great numbers of them. Much has been said both in Parliament and out of it in favour of Dr. JENNER, for making public an old method of preventing the small-pox: granting that a general use of it should be calculated to save the lives of 30,000 persons who otherwise would annually die of the small-pox; there is too much reason to think an equal number are destroyed without murmur by the distilleries of Britain.

BREW-

BREWERIES.

The brewers deliver their porter to the publicans in butts, which contain 108 gallons each, for which a charge is made of seven pounds; but the money is not expected to be then paid, nor until the beer has been sold retail. A collecting-clerk calls every four weeks, inquires into the sale of the month, and then desires payment. The brewer, by his abroad-cooper, is at the charge of finings and labour to preserve the porter in a saleable condition, and he changes all such as is not so; the publican has no stock in beer, he runs no risk with it, he is a mere machine, and mostly as insensible as one. It generally happens, that he might improve his beer in colour and flavour, by mixing such as is too mild with what is too stale, and in this easy manner please his customers. But this little attention is generally more than he can bestow on his business; and being idle, he cannot undertake any trouble; therefore, his customers are ill served, his trade becomes the least which his situation will admit of, and he pines his life away in poverty. The profits of the publicans are 40*s*. per butt, at this time (1806) when retailed by full measure, and without fraud; but too many of them give short measure, and some of them mix small beer with the strong, by which they increase their profits to 45*s*. or 50*s*. per butt. The latter bad practice is known to exist, and it always injures the foolish people whose avarice induces them to resort to it; the trade of such persons dwindle to the lowest. On the contrary, those who are attentive to serve porter of the best quality, are amply remunerated for their trouble by a great increase of sale.

Porter is the most suitable beverage for labouring men

of any that is made; it has the great merit of supporting their strength without intoxicating them.

The following is a Comparative Statement of the Porter brewed by the Twelve first London Brewers, for Five Years, from 1795 *to* 1801.

1796	Barrels.	1797	Barrels.
Whitbread	202,000	Whitbread	192,740
Thrale	137,810	Thrale	141,590
Shum	110,700	Shum	119,820
Hanbury	109,170	Hanbury	117,180
Meux	103,790	Felix Calvert	101,760
Goodwyn	97,580	Goodwyn	94,750
Felix Calvert	97,550	Meux	93,400
John Calvert	68,000	John Calvert	70,090
Clowes	55,770	Clowes	58,680
Elliot	58,250	Elliot	55,800
Cox and Co.	42,110	Cox and Co.	46,100
Stevenson	45,800	Stevenson	45,810
	1,128,530		1,137,720

1798	Barrels.	1799	Barrels.
Whitbread	184,506	Whitbread	208,253
Meux	180,446	Meux	170,719
Thrale	131,519	Barclay	136,298
Shum	123,040	Shum	117,627
Felix Calvert	111,791	Hanbury	116,773
Hanbury	109,727	Felix Calvert	97,241
Goodwyn	84,176	Goodwyn	81,472
Carry forward	925,205		923,383

Brought

Brot. forward	925,205		923,383
John Calvert	72,433	John Calvert	70,076
Clowes	58,489	Elliot	50,936
Elliot	51,542	Clowes	49,115
Biley	45,863	Biley	44,400
Phillips	43,163	Phillips	38,142
	1,196,695		1,176,052

1800.

	Barrels.
Meux	143,946
Barclay	137,405
Whitbread	135,108
Hanbury	131,916
Shum	102,799
Felix Calvert	74,011
Goodwyn	65,014
John Calvert	45,496
Clowes	45,450
Cox	44,358
Elliot	36,683
Harford	32,240
	994,426

Summary.

	Barrels.
1796	1,128,530
1797	1,137,720
1798	1,196,695
1799	1,176,052
1800	994,426
	5,633,423
Annual average	1,126,684

TABLE-BEER BREWERIES.

The following is a Comparative Statement of the Table Beer brewed by the Twelve first London Brewers, for Five Years, from 1796 *to* 1802.

1797.	Barrels.	1798.	Barrels.
Kirkman and Co.	26,533	Kirkman	30,029
Sandford and Co.	18,857	Sandford	20,217
Charrington & Co.	16,043	Charrington	14,482
Nieman and Co.	13,799	Nieman	13,294
Cape, Benjamin	13,000	Cape	12,793
Edmonds and Co.	12,475	Edmonds	13,543
Bond, Edward	10,560	Bond	10,272
Park and Co.	8,739	Park	9,633
Satchell, Richard	7,396	Satchell	9,686
Hale and Co.	6,938	Levesque, John	8,335
Allen, John	6,863	Holbrook, James	6,957
Cowell, John	6,700	Cowell, John	7,575
	147,903		156,916

1799.	Barrels.	1800.	Barrels.
Kirkman	28,266	Kirkman	26,192
Sandford	18,726	Sandford	17,570
Charrington	14,363	Charrington	15,011
Nieman	18,667	Combrune	18,792
Cape	12,327	Cape	12,587
Edmonds	13,964	Edmonds	14,539
Bond	9,245	Stretton	6,969
Park	10,129	Park	7,644
Satchell	10,253	Satchell	7,203
Levesque	9,317	Levesque	10,206
Holbrook	6,481	Sandell	6,573
Cowell	7,547	Cowell	6,663
	159,285		149,949

Kirkman

1801.	Barrels.
Kirkman	22,600
Sandford	17,756
Charrington	14,558
Combrune	14,593
Cape	12,695
Edmonds	15,184
Poulain	12,829
Park	7,158
Satchell	8,193
Holbrook	6,572
Sandell	7,026
Hosman	6,112
	145,276

Summary.	Barrels.
1797	147,903
1798	156,916
1799	159,285
1800	149,949
1801	145,276
	759,329
Annual average	151,866

SECT. VII.—POPULATION.

POLITICAL Writers generally say, "the strength of a nation depends on the number of its inhabitants." This strength may be obtained by increasing the agricultural produce of the country, as that will certainly be followed by a proportional increase of population. On the contrary, population is repressed by scarcity, and the high price of provision, as was evidently the case in Britain during the years 1795 and 1800, when the poor, but more particularly the children of the poor, weak from a deficiency of food, became unable to support themselves under the slightest illness, and were carried off in numbers, greatly increased beyond the usual proportion. The quantity,

When it was proposed to build fifty additional churches in London and Westminster, in the reign of Queen ANNE, it was thought essential, for the purpose of justifying the measure, that Parliament should have some account laid before them, of the population of the City of London, in order to ascertain how far the increase of churches might be necessary, and in what parishes it was more particularly called for. The account was delivered, by the Prolocutor of the Lower House of Convocation, to the Speaker of the House of Commons, and laid before that House on the 10th of March, 1710.

It is said in the Journals, that it relates only to those parishes where additional churches were judged to be most wanted. In this place it may be sufficient to remark, respecting the ecclesiastical part of it, that there existed at that time 28 churches, 18 chapels and tabernacles, 26 presbyterian meeting-houses, 23 anabaptists' meeting-houses, 12 independent meeting-houses, 14 quaker meeting-houses, and 13 French.

Parishes.	*Families.*	*Persons.*
St. Andrew, Holborn,	5000	30,000
St. Anne, Westminster,	2000	12,000
St. Botolph, Aldgate,	4100	24,600
St. Botolph, Aldersgate	1000	6000
St. Botolph, Bishopsgate,	1676	10,056
St. Clement Danes,	1834	11,004
Christ Church, Surrey,	517	3102
St. Giles, Cripplegate,	7100	42,600
St. James, Clerkenwell,	1500	9000
St. Sepulchre's,	2500	15,000
St. Giles in the Fields,	5800	34,800
Carry forward	33,027	198,162

St.

Parishes.	*Families.*		*Persons.*
Brought forward	33,027		198,162
St. Martin in the Fields, ...	4000	at 10 per family,	40,000
St. Mary Magdalen, Bermondsey, ...	2000	.....	12,000
St. Paul, Shadwell, ...	2167	.....	13,002
St. John, Wapping, ...	1250	.....	7500
St. James, Westminster, ...	3000	at 10 per family,	30,000
St. Leonard, Shoreditch, ...	2200	.....	13,200
St. Margaret, Westminster,	4000	at 7 per family,	28,000
St. Paul, Covent-garden, ...	825	.....	4950
St. George, Southwark, ...	1250	.....	7500
St. Olave's, Southwark, ...	2900	.....	17,400
St. Saviour's, Southwark, ...	2334	.....	14,004
St. Mary, Whitechapel, ...	3000	.....	18,000
Poplar and Blackwall, ...	856	.....	5136
Rotherhithe, ...	917	.....	5502
Deptford, ...	2000	.....	12,000
	65,726		426,356

The seven hamlets in Stepney parish, as under:

Ratcliffe	3560	.....	21,360
Limehouse	1170	.....	7020
Mile-end Old Town	470	.....	2820
Wapping, Stepney	3170	.....	19,020
Spital-fields	3570	.....	21,420
Bethnal-green	1416	.....	8496
Mile-end New Town	1077	.....	6462
	14,433		86,598
	65,726		426,356
Total	80,159		512,954

The

The foregoing account is extracted from the Journals of the House of Commons, vol. xvi. page 542.

A very slight inspection of the number of families in the foregoing list, will be sufficient to convince any one, that the greater part of them have been put down without much attention to accuracy. The number of persons appear to have been computed, for the most part, at six per family; in some places at ten; and they amount, on the whole, to six and four-tenths nearly.

Sir WILLIAM PETTY, who estimated from the hearth-books in 1685, was of opinion that the number of houses *within the bills of mortality* amounted to 105,315.

It has been said by DR. D'AVENANT, who also formed his estimate from the hearth-books, that in the year 1690, the number of houses *in all Middlesex* were 111,215. This was only 24 years after the fire of London, and several of the houses which had been consumed were not then re-built. A map of London at that time, compared with the present extent of the town, shews that it is nearly double its former magnitude; and it is notorious, that every village near the metropolis has increased its number of houses: notwithstanding all these additional buildings, it will presently appear, that the houses in Middlesex even at this time, exceed the Doctor's number only 1697, and that at the time he wrote, they could be little, if any thing, more than 80,000.

Forty-seven years subsequent to this period, namely, in the year 1737, MAITLAND, by *actual enumeration*, discovered that the number of houses *within* the bills of mortality were 95,968, whereof 80,123 were in the county of Middlesex, which is in the proportion of 90,000 only for the whole county.

Many writers have, within the last thirty years, undertaken to estimate the number of inhabitants *within* the bills

bills of mortality; but unfortunately, their several accounts differ so much as from 600,000 to upwards of a million.

Dr. PRICE published very plausible reasons in support of the opinion, that about one in 20¼ died annually in London, between the years 1758 and 1769. And, taking the interments at 29,000, it produced him the No. 601,750, as the amount of the whole population *within* the limits of the bills of mortality.

Mr. WALES, in 1771, stated them at 625,131. Dr. FORDYCE has lately, but evidently without sufficient data, called them a million; and Mr. COLQUHOUN, still more recently, has asserted that the inhabitants of the metropolis are 1,200,000.

The Rev. JOHN HOWLETT, after having collected lists of baptisms and burials from a great variety of parishes lying dispersed through most of the English counties, and having satisfactorily proved an increasing population in the kingdom, contrary to the opinion which Dr. PRICE had supported, about the year 1782 published his account, which stated the number of inhabitants *within* the bills of mortality, to be between 8 and 900,000. It now appears that Mr. HOWLETT's calculations relative to London, were surprisingly near giving the true number of inhabitants.

An

Abstract of the Returns made to Parliament in 1801 from Middlesex, pursuant to an Act passed the preceding Year.

Hundred, &c.	Parish, Township, or Extra Parochial Place.		Houses.			Persons.		Occupations.			Total of Persons.
			Inhabited	Inhabited and Uninhabited	Building	Males	Females	Persons employed in Agriculture	Persons employed in Trade, Manufacture, and Handicraft	All other Persons not included in the preceding Classes	
Edmonton	Edmonton	parish	901	950	47	2438	2565	412	557	4124	5003
	Enfield	parish	920	1108	97	2905	2996	612	478	4761	5881
	Minchin, South	parish	291	444	8	810	700	90	95	1501	1696
	Monken Hadley	parish	113	110	0	213	341	41	97	476	584
	Tottenham	parish	896	704	49	1901	1948	103	331	3135	3629
	5		2041	3175	172	8285	8600	1357	1528	14,000	16,885
Elthorne	Brentford, New	town	272	370	15	655	790	24	314	1085	1443
	Cowley	village	40	51	.	111	103	74	107	33	214
	Cranford	parish	27	44	2	103	110	30	19	4	212
	Drayton, West	parish	96	110	4	203	230	81	56	11	515
	Greenford	parish	65	66	2	197	164	40	6	313	359
	Hanwell	parish	120	105	4	410	371	59	78	686	817
	Harefield	parish	160	180	3	503	448	109	122	640	951
	Harlington	parish	70	77	..	170	164	301	50	12	363
	Harmondsworth	parish	115	183	..	484	395	278	53	551	879
	Hayes	parish	[illegible]	[illegible]	..	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

	Brought forward	.....	6102	13,401	228	24,998	30,589	..	9928	45,659	55,587
	St. George, Bloomsb.	parish	916	1726	16	3409	4329	..	1321	6417	7738
	St. John, Hampst.	parish	691	953	47	1799	2544	199	426	3718	4343
	St. Mary le Bone	parish	7209	15,378	555	27,012	36,970	371	7977	55,634	63,982
	Paddington	parish	324	417	33	870	1011	158	160	1563	1681
	St. Pancras	parish	4173	7376	253	14,009	17,770	..	3779	28,000	31,779
	Rolls Liberty	liberty	330	621	14	1134	1275	..	580	1829	2409
	St. John Baptist, Savoy	precin.	38	77	2	144	176	..	101	219	320
	Saffron Hill, Hatton Garden, & Ely Rents	liberties	900	2208	39	3544	3956	..	2116	5384	7500
	Ely Place	extra p.	45	46	..	114	167	..	22	259	281
	14		20,728	42,503	1187	77,033	98,787	728	26,410	148,682	175,820
Isleworth	Heston	parish	284	466	10	851	931	259	139	1384	1782
	Isleworth	parish	733	977	35	2069	2277	257	322	3767	4346
	Twickenham	parish	622	868	36	1362	1776	121	256	2761	3138
	3		1639	2311	81	4282	4984	637	717	7912	9266

	Brought forward	.....	6102	13,401	228	24,998	30,589	..	9928	45,659	55,587
	St. George, Bloomsb.	parish	916	1726	16	3409	4329	..	1321	6417	7738
	St. John, Hampst.	parish	691	953	47	1799	2544	199	426	3718	4343
	St. Mary le Bone	parish	7209	15,378	555	27,012	36,970	371	7977	55,634	63,982
	Paddington	parish	324	417	33	870	1011	158	160	1563	1881
	St. Pancras	parish	4173	7376	253	14,009	17,770	..	3779	28,000	31,779
	Rolls Liberty	liberty	330	621	14	1134	1275	..	580	1829	2409
	St. John Baptist, Savoy	precin.	38	77	2	144	176	..	101	219	320
	Saffron Hill, Hatton Garden, & Ely Rents	liberties	900	2208	39	3544	3956	..	2116	5384	7500
	Ely Place	extra p.	45	46	..	114	167	..	22	259	281
	14		20,728	42,503	1187	77,033	98,787	728	26,410	148,682	175,820
Isleworth	Heston	parish	284	466	10	851	931	259	139	1384	1782
	Isleworth	parish	733	977	35	2069	2277	257	322	3767	4346
	Twickenham	parish	622	868	36	1362	1776	121	256	2761	3138
	3		1639	2311	81	4282	4984	637	717	7912	9266

Hundred, &c.	Parish, Township, or Extra Parochial Place.		Houses. Inhabited.	Houses. By how many Families occupied.	Houses. Uninhabited.	Persons. Males.	Persons. Females.	Occupations. Persons chiefly employed in Agriculture.	Occupations. Persons chiefly employed in Trade, Manufacture, or Handicraft.	Occupations. All other Persons not comprised in the two preceding Classes.	Total of Persons.
Tower Division continued	Brought forward	.....	24,216	38,535	1243	68,032	82,206	2624	29,439	118,630	150,238
	Mile-end, New Town	hamlet	610	1484	26	2294	2959	..	1516	345	5253
	Ditto, Old Town..	hamlet	1627	2137	38	4046	5802	71	664	9113	9848
	Norton Falgate ..	liberty	252	420	8	779	973	..	485	1267	1752
	St. Paul, Shadwell	parish	1550	2647	48	3622	5206	..	973	7855	8828
	Poplar & Blackwall	hamlets	756	1107	30	2229	2264	34	1009	3450	4493
	Ratcliffe	hamlet	925	1513	16	2550	3116	23	1309	4334	5666
	Tower, or St. Catherine Precinct	precin.	505	637	18	1192	1460	..	521	2131	2652
	Liberty of Tower, Without	precin.	82	145	2	269	294	..	111	452	563
	19		30,523	48,625	1429	85,013	104,280	2752	36,027	147,577	189,298

London City within the Walls	Alban, St. Wood-st.	parish	102	140	4	343	339	..	189	493	682
	Allhallows, Barking	parish	274	449	4	954	1133	1	558	1528	2087
	Ditto, in Bread-st.	parish	62	102	4	236	194	..	209	221	430
	Ditto, the Great ..	parish	77	144	..	283	289	..	197	375	572
	Ditto, Honey-lane	parish	29	34	..	99	76	..	92	83	175
	Ditto, the Less ..	parish	26	42	1	129	115	..	203	41	244
	Ditto, Lombard-st.	parish	103	126	1	351	328	..	284	395	679
	Ditto, Staining ..	parish	114	130	..	332	382	..	174	541	714
	Ditto, London-wall	parish	192	362	7	735	817	..	276	1276	1552
	Alphage, St.	parish	142	257	7	490	518	..	253	755	1008
	Andrew, St. Hubbard	parish	52	63	1	186	190	..	124	252	376
	Ditto, Undershaft	parish	173	203	3	638	669	..	368	939	1307
	Ditto, by the Wardrobe ..	parish	95	226	3	449	451	6	186	708	900
	Anne and Agnes, within Aldersgate	parish	123	232	2	515	437	..	381	571	952
	Ann, St. Blackfriars	parish	288	755	7	1355	1716	..	1346	1725	3071
	Anthony, St.	parish	73	79	1	185	178	..	124	239	363
	Augustin, St.	parish	49	68	2	184	149	..	57	276	333
	Bartholomew, by the Royal Exchange	parish	87	92	3	284	276	..	171	389	560
			2061	3504	50	7748	8257	7	5192	10,807	16,005

Hundred, &c.	Parish, Township, or Extra Parochial Place.		Houses. Inhabited.	Houses. By how many Families occupied.	Houses. Uninhabited.	Persons. Males.	Persons. Females.	Occupations. Persons chiefly employed in Agriculture.	Occupations. Persons chiefly employed in Trade, Manufactures, or Handicraft.	Occupations. All other Persons not comprised in the two preceding Classes.	Total of Persons.
Tower Division continued	Brought forward	.....	24,216	38,535	1243	68,032	82,206	2624	29,439	118,630	150,238
	Mile-end, New Town	hamlet	610	1484	26	2294	2959	..	1516	345	5253
	Ditto, Old Town..	hamlet	1627	2137	38	4046	5802	71	664	9113	9848
	Norton Falgate ..	liberty	252	420	8	779	973	..	485	1267	1752
	St. Paul, Shadwell	parish	1550	2647	48	3622	5206	..	973	7855	8828
	Poplar & Blackwall	hamlets	756	1107	30	2229	2264	34	1009	3450	4493
	Ratcliffe	hamlet	925	1513	16	2550	3116	23	1309	4334	5666
	Tower, or St. Catherine Precinct	precin.	505	637	18	1192	1460	..	521	2131	2652
	Liberty of Tower, Without	precin.	82	145	2	269	294	..	111	452	563
	19		30,523	48,625	1429	85,013	104,280	2752	36,027	147,577	189,293

London City within the Walls, continued	Brought forward	.....	4467	7498	136	16,727	17,627	8	10,306	23,625	34,354
	Ethelburga, St. ..	parish	84	138	3	309	290	..	157	442	599
	Faith, St. the Virgin, under St. Paul's	parish	139	183	13	498	466	..	225	739	964
	Gabriel, St. Fenchurch-street	parish	70	118	..	244	265	..	129*	116	509
	George, St. Botolph-lane	parish	39	41	..	107	147	..	59	195	254
	Gregory, St.	parish	222	344	6	785	849	..	118	1516	1634
	Helen, St. near Bishopsgate	parish	*	128	2	306	349	..	199	456	655
	James, St. in Duke's-place	parish	107	233	10	439	412	..	67	784	851
	Ditto, Garlickhithe	parish	78	162	1	297	298	..	217	378	595
	John, St. Baptist ..	parish	63	57	5	194	218	..	116	296	412
	John, St. Evangelist	parish	25	20	5	69	56	..	54	71	125
	John, St. Zachary	parish	74	137	..	247	260	..	202	305	507
	Catherine, St. Coleman	parish	79	104	3	350	382	..	229	503	732
	Ditto, Cree-church	parish	219	326	3	823	904	..	479	1248	1727
	Lawrence, Jewry-st.	parish	129	138	10	394	406	..	317	483	800
	Lawrence, St. Pountney	parish	56	66	..	185	170	..	93	262	355
			5851	9693	197	21,974	23,099	8	12,967	31,419	45,073

Hundred, &c.	Parish, Township, or Extra Parochial Place.		Houses. Inhabited.	Houses. By how many Families occupied.	Houses. Uninhabited.	Persons. Males.	Persons. Females.	Occupations. Persons chiefly employed in Agriculture.	Occupations. Persons chiefly employed in Trade, Manufactures, or Handicraft.	Occupations. All other Persons not comprised in the two preceding Classes.	Total of Persons.
London City within the Walls, continued	Brought forward	.....	2061	3504	50	7748	8257	7	5192	10,807	16,005
	Benne't, St. Fink..	parish	82	91	3	271	268	..	150	389	539
	Do. Gracechurch-st.	parish	50	92	8	206	223	..	153	276	429
	Do. Paul's Wharf..	parish	80	153	4	312	308	1	51*	152	620
	Do. Sherehog	parish	29	28	2	100	86	..	27	159	186
	Botolph, St. Bishopsgate	parish	1285	2458	48	4745	5569	..	2949	7365	10,314
	Christ Church	parish	325	468	9	1645	1173	..	746	2072	2818
	Christopher le Stork, St. ..	parish	19	23	..	61	72	..	21	112	133
	Clement, St. near East Cheap	parish	52	67	2	190	162	..	120	232	352
	Dionas, St. Back Church	parish	128	173	2	419	449	..	276	592	868
	Dunstan's, St. in the East	parish	152	192	3	509	544	..	271	782	1053
	Edmund, St. the	lower prec.	85	108	5	263	297	..	197	363	560

	Brought forward - -		7351	12,012	250	27,247	28,224	8	16,981	37,796	55,471
London City within the Walls, continued	Mary, St. Somerset - -	parish	52	117	3	229	230	—	287	172	459
	Ditto, Staining - -	parish	40	54	—	112	127	—	68	171	239
	Ditto, Woolchurch Haw -	parish	38	42	2	145	125	—	95	175	270
	Ditto, Woolnoth - -	parish	73	100	2	302	249	—	175	376	551
	Matthew, St. Friday-st. -	parish	39	34	3	119	90	—	98	111	209
	Michael, St. Bassishaw - -	parish	122	146	1	356	391	—	236	511	747
	Ditto, Cornhill - -	parish	98	103	4	348	343	—	241	450	691
	Ditto, Crooked-lane -	parish	92	153	—	298	320	—	189	429	618
	Ditto, Queenhithe -	parish	92	208	—	404	423	—	495	332	827
	Ditto, le Queen - -	parish	53	68	2	212	178	—	177	213	390
	Ditto, Paternoster Royal	parish	35	59	—	177	130	—	86	221	307
	Ditto, Wood-st. - -	parish	78	155	—	312	262	—	256	318	574
	Mildred, St. Bread-st. - -	parish	42	63	9	138	143	—	116	165	281
	Ditto, the Virgin, in the Poultry	parish	54	58	—	296	208	—	129	375	504
	Nicholas, St. Acons - -	parish	41	45	1	151	124	—	90	185	275
	Ditto, Cole-abbey -	parish	31	44	—	146	111	—	131	126	257
	Ditto, Olave - -	parish	45	53	2	174	150	—	324	—	324
	Olave, St. Hart-st. - -	parish	190	237	7	500	716	1	231	984	1216
	Ditto, Old Jewry - -	parish	55	56	5	135	166	—	95	206	301
	Ditto, Silver-st. - -	parish	156	378	3	505	573	1	310	767	1078
	Pancras, St. - : - -	parish	32	37	—	113	104	—	76	141	217
	Peter, St. Westcheap - -	parish	51	46	1	177	158	—	171	164	335
	Ditto, Cornhill - -	parish	128	129	9	513	490	—	560	443	1003
	Ditto, near Paul's-wharf	parish	44	98	—	173	180	—	44	309	353
	Ditto, le Poor, in Broad-st.	parish	130	168	2	413	454	—	138	729	867
	Stephen, St. Colman-st. - -	parish	386	755	2	1551	1674	—	602	2623	3225
	Stephen, St. Walbrook - -	parish	60	60	2	155	185	—	70	270	340
	Swithin, St. London-stone - -	parish	85	474	1	242	232	—	125	349	474
	Thomas, St. the Apostle - -	parish	97	131	2	277	289	—	199	367	566
			0790	16,103	313	35,920	37,049	10	22,795	49,478	72,969

Hundred, &c.	Parish, Township, or Extra Parochial Place.		Houses. Inhabited.	Houses. By how many Families occupied.	Houses. Uninhabited.	Persons. Males.	Persons. Females.	Occupations. Persons chiefly employed in Agriculture.	Occupations. Persons chiefly employed in Trade, Manufactures, or Handicraft.	Occupations. All other persons not comprised in the two preceding Classes.	Total of Persons.
London City within the Walls, continued	Brought forward - -		9790	16,103	313	35,920	37,049	10	22,795	49,478	72,969
	Trinity, Minories - - -	liberty	93	142	5	309	335	—	216	428	644
	Trinity - - - - -	parish	68	162	—	277	281	—	327	231	558
	Vedast, St. Foster - -	parish	64	76	10	233	190	—	185	258	423
	White-friars Precinct - -	parish	88	191	1	374	409	1	195	587	783
	100		10,103	16,674	329	37,113	38,264	11	23,718	50,982	75,377
London City without the Walls	Andrew, St. Holborn - -	parish	623	1444	16	2649	2862	—	1661	3850	5511
	Bartholomew, St. the Great - -	parish	324	602	13	1258	1387	—	841	1804	2645
	Ditto, the Less - - -	parish	68	106	—	232	239	—	135	336	471
		hospital	—	—	—	243	238	—	—	—	481
	Botolph, St. without Aldersgate	parish	557	1063	24	2006	2155	2	1351	2808	4161
	Botolph, St. without Aldgate -	parish	1171	2241	31	4161	4528	9	2601	6079	8689
	Botolph, St. without Billingsgate	parish	31	31	—	89	107	—	62	134	196
	Bride, St. - - - -	parish	830	1592	51	3424	3654	—	2310	4768	7078
	Dunstan, St. in the West - -	parish	405	747	7	1467	1554	—	858	2163	3021
	Giles, St. without Cripplegate -	parish	1509	3118	28	5496	5950	36	2466	8944	11,446
	Sepulchre, St. without Newgate†	parish	856	1865	36	4071	4021	3	2704	5385	8092
	Bridewell Precinct - -	parish	61	85	2	209	244	—	74*	333	453
	Barnard's-inn - - -	extra p.	34	30	7	28	9	—	—	37	37
	Clement's-inn - - -	extra p.	68	68	—	82	58	—	42	98	140
	Clifford's-inn - - - -	extra p.	72	38	8	71	42	—	—	113	113

London City without the Walls, continued	Brought forward - -		6610	13,030	223	25,486	27,048	50	15,105	36,852	52,534
	Furnival's-inn - - -	extra p.	50	42	—	46	34	—	—	80	80
	Gray's-inn - - - - -	extra p.	236	185	4	206	83	—	3	286	289
	Inner Temple - - - - -	extra p.	334	—	8	368	117	—	—	485	485
	Lincoln's-inn - - - - -	extra p.	89	—	13	146	33	—	—*	—	179
	Middle Temple - - -	extra p.	280	380	22	245	137	—	—	382	382
	Sergeant's-inn, Chancery-lane -	extra p.	6	12	—	12	10	—	—	22	22
	Sergeant's-inn, Fleet-st. - -	extra p.	18	19	—	40	73	—	—	113	113
	Staple-inn - - - - -	extra p.	42	42	—	49	18	—	1	66	67
	22		7665	13,710	271	26,598	27,553	50	15,109	38,286	54,151
Westminster	St. Anne - - - - -	parish	1294	2471	88	5249	6388	—	3477	8160	11,637
	St. Clement Danes - -	parish	963	2333	37	4232	4485	—	2676	6041	8717
	St. George, Hanover-square -	parish	4344	8170	91	16,779	21,661	163	5989	32,288	38,440
	St. James - - - - - -	parish	3430	10,448	169	16,224	18,238	7	8668	25,787	34,462
	St. Margaret - - - - -	parish	2367	4956	97	7131	10,377	43	2792	14,673	17,508
	St. John the Evangelist - -	parish	1268	2546	121	3613	4762	42	1827	6506	8375
	St. Martin in the Fields -	parish	2791	5888	112	12,073	13,699	—	6043	19,709	25,752
	St. Mary le Strand - -	parish	166	425	9	796	908	—	494	1210	1704
	St. Paul, Covent-garden - -	parish	598	1239	22	2202	2790	—	1910	3082	4992
	Verge of the Palaces of Whitehall and St. James - -	—	241	272	11	707	978	23	58	1604	1685
	10		17,462	38,748	757	68,986	84,286	278	33,934	119,060	153,272

Note.—The numbers under occupations and inhabited houses, are wrong in the parts marked *, and probably in some other places.

Summary of Middlesex.

	Houses.			Persons.		Occupations.			
	Inhabited.	By how many Families occupied.	Uninhabited.	Males.	Females.	Persons chiefly employed in Agriculture.	Persons chiefly employed in Trade, Manufactures, or Handicraft.	All other Persons not comprised in the two preceding Classes.	Total of Persons.
5 Edmonton Hundred	2831	3475	172	8285	8600	1357	1528	14,000	16,885
17 Elthorne ditto	2315	2740	68	6394	6565	2805	1751	7932	12,959
11 Finsbury Division	10,605	18,314	334	33,585	39,683	592	14,761	57,915	73,268
7 Gore Hundred	1177	1343	57	3633	3335	1115	859	4994	6968
14 Holborn Division	20,728	42,503	1187	77,033	98,787	728	26,410	148,682	175,820
8 Isleworth Hundred	1639	2311	81	4282	4984	637	717	7912	9266
9 Kensington ditto	6285	9434	406	17,790	22,852	1636	5890	28,888	40,642
13 Spelthorne ditto	1609	1997	80	4943	5285	1456	1556	6981	10,228
19 Tower Division	30,523	48,625	1429	85,013	104,280	2752	36,027	147,577	189,293
98	77,712	130,742	3814	240,958	294,371	13,078	89,499	424,881	535,329

Summary of London and Westminster.

100 City of London, within the Walls	10,103	16,674	329	37,113	38,264	11	23,718	50,982	75,377
22 Ditto, without the Walls	7665	13,710	271	26,598	27,553	50	15,109	38,286	54,151
10 City of Westminster	17,462	38,748	757	68,986	84,286	278	33,934	119,060	153,272
132	35,230	69,132	1357	132,697	150,103	339	72,761	208,328	282,800
230 Total	112,942	199,874	5171	373,655	444,474	13,417	162,260	633,209	818,129

Observation.—The number of families returned in Middlesex is beyond the truth, because some parishes in London returned each lodger as a separate family.

CHAP. XVI.

OBSTACLES TO IMPROVEMENT,

INCLUDING GENERAL OBSERVATIONS ON AGRICULTURAL LEGISLATION AND POLICE.

THE spirited and intelligent agriculturist, whose object is the improvement of the soil he cultivates, has too often so many obstacles thrown in his way, and so many adversaries to contend with, as in the whole to present an insurmountable barrier; which compels him to turn his thoughts from the means of removing them, towards a situation where fewer of them prevail; to land that is *enclosed*, *tithe-free*, and of which he can have *a lease*, drawn in such a manner as to give him an interest in the improvement of the soil. On any less favourable conditions, no sensible man would submit to be a farmer. These situations are seldom to be met with; and, consequently, the fact ought not to excite any surprise, of there being only a small portion of land in Britain, which is cultivated in such a superior manner as to approach perfection.

The most powerful obstacles to improvement, are the very great and general want of agricultural knowledge in the *managers of landed-estates*; the want of ingenuity and dexterity in the *rural artificers*; the impolicy of withholding *well-regulated leases*; and the repressive nature of tithes*. These shackles cramp and paralize every effort

* A paper on the injurious tendency of tithes, may be seen in the Appendix to a Treatise on the Culture of the Apple and the Pear, by the justly celebrated T. A. KNIGHT, Esq.

which

which can be made towards the improvement of this valuable art; and so long as the agriculture of this kingdom is compelled to endure them, any considerable improvement of the soil is utterly impracticable.

Commons.—In Britain, though a country celebrated for enterprise and industry, we have upwards of twenty-two million acres of land called commons, which are, for the most part, absolute nuisances: the whole of which would be enclosed, and the greater part of it cultivated, if the people were not restrained by the positive law of the land. Thus, under the idle pretence of securing a few wretched common-rights, the law operates, in the most effectual manner, to perpetuate the most ruinous consequences, by repressing the amount of the agricultural produce of the nation many millions per annum below what it might be, and by keeping down the population in a similar proportion.

A comparison of the exportation of corn, with the importation of it, and the occasional very high price of both animal and vegetable food, affords such ample proof, that a candid and dispassionate consideration of the matter would convince every person who is capable of forming a sound opinion on such a subject, that the population of the nation demands the extensive tracts of waste, which disgrace the island, should be brought into a state of cultivation and improvement: this is the only method of preserving the lives of a very great number of the inhabitants of Britain, who otherwise must die from insufficiency of food. The scarcity of provision was so great in Britain during the years 1796 and 1800, as to occasion the death of upwards of one hundred thousand persons: what other method is so likely to postpone a recurrence of

lamity, as subjecting the commons to culti-

ble obstacle in the way of improving waste
mon arable fields, is the unreasonable ex-
; the obtaining acts of parliament to autho-
sure. This evil operates very much against
parliament for that purpose; prevents the
ltivation, and keeps down the agricultural

Ionourable the Earl of BERKELEY suggests,
eived on passing acts of enclosures through
f parliament, should be abolished; which
the general expense so much as to make
small object. The Reverend Dr. VYSE
this suggestion of the noble Earl, that the
ament have obtained the soliciting of every
he two houses; and in every case, the acce-
e passing of the several acts depends on the
management of the clerks, who receiving a
step the bill makes in its progress, are excited
ir ingenuity and industry to obtain this end as
sible: which is the means of keeping down
e that would be incurred by the long attendance
es and witnesses. He therefore thinks, that
the fess to clerks, would defeat the intended
y increasing the expense in the attendance of
e persons, and by rendering the passing of acts
sure a very tedious, up-hill business. But as the
of unproductive land into a state of cultivation
ovement, is a great national object, he recom-
at the expense should be defrayed out of the na-
rse. With this latter opinion I am inclined to
id no one can doubt that the application for

local acts to divide and enclose waste lands, would be multiplied in consequence of it.

Water Mills.—These are, in general, obstructions to the great improvements that would otherwise be made by irrigation. In flat wet countries, they materially injure the agricultural produce, by damming the water too high. Besides this, the proprietors of mills universally oppose the introduction of canals, which is throwing one of the most considerable obstacles in the way of agricultural improvement; as nothing tends more towards effecting an increased production from the soil, than a safe, easy, and cheap conveyance of such product to market.

AGRICULTURAL LEGISLATION AND POLICE.

One great hindrance to comfort in a life of agriculture, and which drives liberal minded men, who are always the best friends to improvement, out of the profession, is the want of laws to put a total stop to the receivers of stolen goods. These are the wretches who encourage servants in agriculture, and others, to pilfer, by holding out the lure of buying every article which such servants can bring, without asking them any questions. Most things which are usually produced on a farm, from so small an article as an egg, to hay, straw, and grain of all sorts, are daily stolen, and sold on the sides of every principal road in this county.

These thefts are carried on daily at every farm, in a small way, seldom exceeding a truss of hay, or a bushel of corn, by one man at one time; but generally of smaller articles. When one of these fellows is taken in the act of stealing to the amount of a shilling or two, no master

in

in his senses would prosecute, as that would be attended with the certain expense of 20*l.* in money, and the loss of much time. In this manner thieves are permitted to escape from punishment, which has the bad effect of increasing the numbers of them; and they are further excited to commit theft, by the facility with which they can change stolen property for beer and gin at the public-houses.

The moral principle of the rural servants and labourers of this county is at so low an ebb, that it is supposed not one in a hundred, or perhaps in five hundred, are honest, and faithful to their masters. Their minds have been contaminated, and every honest idea banished, in consequence of being continually assailed by women calling for rags, broken glass, and kitchen-stuff; pretended gypsies, itinerant jews, ballad-singers and show-men, strolling from house to house, pilfering every little article they happen to meet with, and tempting and encouraging servants and labourers to do the same, by offering to purchase every portable article. To these may be added, millers, ostlers, and corn-chandlers, dealers in eggs, butter and poultry, plumbers, blacksmiths, and publicans, chandlers' shops, old iron shops, old clothes shops, and rag shops, low brokers of furniture, and pawnbrokers. These are the persons who principally buy the property stolen from farmers, and are only a part of the nursery which has raised such a plentiful crop in and near London, as fully to justify the author of the Treatise on the Police of the Metropolis, in stating the number of persons whose pursuits are either criminal, illegal, or immoral, at 115,000.

This certainty of being able to sell stolen property without being detected, has made thieves of most of the labourers in husbandry within this county. It is known and lamented by the common farmers; and also by others, who, having acquired moderate fortunes in London, fre-

quently take a farm to amuse themselves during the latter part of their lives, and who are, almost to a certainty, ruined by their servants. Gentlemen of fortune, who have made agriculture their study, and embarked in it for experiment and amusement, are, generally, so fleeced by their servants, acting under the influence of buyers of stolen goods, as to change the pleasures and amusements into a torment and loss.

The drivers of gentlemen's carriages are entrusted to buy hay, straw, and corn for their horses; in the doing of which, they generally cheat their masters of from 3*s.* to 5*s.* in each load of hay; of 2*s.* in every load of straw; and of 1*s.* in every quarter of corn. This gives them an interest in the consumption, makes them extremely wasteful, and brings on habits of dishonesty.

The ostlers at the inns on the sides of the roads, purchase stolen hay, straw, corn, eggs, and poultry. The writer of this is informed by a person who kept a horse several weeks at one of these inns, that in attending occasionally to see his horse, he discovered him to be fed with wheat, barley and oats mixed together, and partly in the chaff, which could only happen by the farmers' servants robbing their masters, and selling the corn to the ostler.

The fields near London are never free from men strolling about in pilfering pursuits by day, and committing greater crimes by night. The depredations every Sunday, are astonishingly great. There are not many gardens within five miles of London that escape being visited in a marauding way, very early on a Sunday morning, and the farmers' fields are plundered all day long of fruit, roots, cabbages, pulse and corn. Even the ears of wheat are cut from the sheaves, and carried away in the most daring manner in open day, in the hand, occasionally in pockets, and sometimes in bags containing about half a bushel each.

The

The occupiers of several thousand acres round London, lose annually in this manner to the amount of much more than 20*s.* an acre. The number of persons who commit these depredations are so great, as to make the loss a very serious thing to the owners of it, as may be supposed, when it has been moderately estimated at 30 or 40,000*l.* per annum. And all this is done, as it were, under the eye of 300 magistrates, 1000 constables, and upwards of 2500 watchmen and beadles. These men are more attentive to their own emoluments, and more desirous of promoting their own interests, than putting a stop to these nefarious practices*.

I admit that depredations of this kind are not confined to London: they are certainly committed in a proportion-

* The following list appeared in some of the London newspapers, as a correct statement of the force of the Police existing in the Metropolis in the Year 1802:

City of London—the marshalmen, beadles, and constables, amount to	319
Watchmen and patroles	803
City and Liberty of Westminster—constables	71
Watchmen and patroles	302
Holborn division—constables	79
Watchmen and patroles	377
Finsbury division—constables	69
Watchmen and patroles	135
Tower Hamlets, including the eastern part of the town constables	218
Watchmen and patroles	268
Liberty of the Tower of London—constables	17
Watchmen and patroles	14
Division of Kensington and Chelsea—constables	22
Watchmen and patroles	66
Borough of Southwark—constables	88
Watchmen and patroles	79
Seven Police offices, including Bow-street—Officers and patroles	150
The whole number of persons	3077

ate degree near every city and great town. I have seen upwards of twenty thieves at one time in a ten acre field of turnips, each of whom carried away as many as he could stand under. On another occasion, one man staying longer than several others, stealing pears, was secured and taken before a magistrate, who ordered him to pay the value of the fruit found on him (viz. 1*s.*), which he paid, and was discharged.

A miller near London being questioned as to small parcels of wheat brought to his mill to be ground, by a suspected person, soon after several barns had been robbed, answered, that any explanation on that head would put his mills in danger of being burnt. Well may the *farmers* say, "their *property is not protected like that of other men*," which is the more extraordinary, as all the depredations to which I have confined my observations, are committed on the landed interest, and probably amount to 2*s.* an acre on all the cultivated lands of England, or to four millions of pounds sterling per annum. Including game and vermin, as mentioned under those heads, the depredations committed on farmers' property amounts to more than twenty millions annually*.

It is by the committing of petty crimes that dishonesty begins; but it seldom or never ends without proceeding to enormities. It is a misfortune equally heavy on the poor as on the rich, that every possible difficulty is not created by law to stop *dishonesty* in every stage of its progression, in order to render the lives and property of

* The depredations committed on other property in and near London, Mr. COLQUHOUN estimates at 2,100,000*l.* a year: including all the rest of England, it is probably five millions, which, added to the sum mentioned in the text, swells the whole amount to the enormous sum of about twenty-five millions a year.—*J. M.*

the

the rich safe, and both rich and poor comfortable. The smallest transgression should not pass without its immediate and proportionate punishment.

The commission of crimes has spread far and wide, and got to such an height, that "the vilest and most depraved part of the community are suffered to deprive us of the privilege of travelling on the highways, or of approaching the capital, or our own dwellings, within this county and Surrey, in any direction, after dark, without danger of being assaulted and robbed, and perhaps wounded or murdered; nor can we lie down to rest, without the dread of having our houses burnt, or broke into; our property invaded, and our lives exposed to imminent danger, before the morning.*"

Surely these abuses call, with an imperious voice, for some remedy: *can agriculture*, or indeed any other branch of business, be expected to *flourish, while such things are practised?*

The cure for so mighty an evil, would require a law, enjoining every person annually to state, by what means he gains his livelihood, to some tribunal competent to scrutinize the information, and punish the party if it be false.

At the same time should be formed, *a scale of offences, with a corresponding punishment*, beginning at the slightest misdemeanour, and ascending progressively to the highest crime. Such a work might be easily performed; and if it were made the law of the land, the benefits which would result from it to society are incalculable.

---

* Within two or three miles of my own residence, at least one set of farmer's buildings are burnt down every year. Also, a man continued for a year and a half, armed with a gun, to rob at any hour, before he was disturbed, by either the inhabitants or the police.—*J. M.*

The crops of the farmer ought to be secured to him, and his fields rendered as free from pilfering trespassers, as are the warehouse and shop of the manufacturer and tradesman.

Next to the making of laws with wisdom, it is absolutely necessary to secure a prompt and perfect execution of them. Without this, the best laws will remain a dead letter. Such is, in fact, the case, in a great measure, with respect to several of the very excellent statutes now in force, that were, no doubt, intended by the Legislature to operate as a security to the good and the honest, against the depredations of the dishonest and the vicious; and such indeed would be the case with respect to the laws relative to the public revenue, were it not, that in this latter case a very proper care has been taken to secure a most exact and scrupulous execution of them. Certainly, however, the safety, comfort, and moral welfare of society, require that the *former* should be enforced with a degree of attention and care, greatly more rigid and watchful than the *latter*.

It is in every respect useless to complain of the manners of any people, and of their vices, for they are every where merely machines, or the creatures of government; they are educated according to its dogmas, and trained by its institutions; these enslave and chain down their minds by prejudice, which enfeebles their intellectual vigour, and bears down their rational faculties. Government has the principal share in exciting or depressing mental energy, in establishing general industry or indolence, in promoting public happiness or misery. Are the people of any nation possessed of great mental energy, industrious, virtuous and happy; the government has produced these effects, and consequently it is excellent. Are they ignorant, idle wicked and wretched, they are counterparts of a bad government, which could produce so much misery.

Government

Government make the laws, and they are the express image of their maker: these mould the people into their own likeness, therefore subjects are every where such as the ruling powers have made them: are the latter pious, just, and good, the former will consequently become of the same description. Such a Prince would reign in the hearts of his subjects, and of such a government there would be no end. If there be a King in Asia or in Africa, living in the daily practice of all the greater vices, his court will do the same, the laws which such men enact, will be of the same dark complexion, and the subjects of such a sovereign will be as vicious as himself. Should the Imperia Court of Morocco by any means be placed over the most virtuous people that imagination can figure to itself, two generations would scarcely pass away before this virtuous nation would be as barbarous and savage as the present wretched inhabitants of North Africa.

The inhabitants of Egypt, Greece, and Rome, in succession, have been the most wise and polished in the world, but they are now so much fallen, as to be the poorest and most miserable of the human race; such a change for the worse, as we know has taken place in those nations, could not be brought about by any other power on earth than the crushing effects of bad government.

The history of all nations prove, that where the government does not prescribe to itself any bounds of improper conduct, it cannot be expected the people should. Hence it is of the highest importance, that the rulers of a nation should practice every virtue, and that the laws should be calculated to produce the same conduct in the people.

The Turkish method of shutting the city gates at one hour after sunset, might be improved on, by having gates at each end of every street in London, and other considerable great towns: shutting them at eleven o'clock, and opening

opening them at four, would put a stop to house-breaking, and reduce every other species of theft to a trifle.

It is a duty incumbent on every government to try all possible means of stimulating its subjects to virtuous deeds, and to deter them from evil actions; which might be done by praising, honouring, and rewarding the former, as well as by attaching shame, contempt, and punishment on the latter. In this, and many other particulars, we might copy with great advantage the government of China, which carries this work of public justice to a higher degree of perfection than any other nation on earth. We are informed by Sir GEORGE STAUNTON, that a Book of Merit is kept, for the purpose of recording every striking instance of meritorious conduct; and in the enumeration of a man's titles, the number of times that his name had been so inserted is particularly mentioned. For faults, on the other hand, he is subject to be degraded, and it is not sufficient that he should assume only his reduced title; but he must likewise add to his name the fact of his degradation.

CHAP. XVII.

MISCELLANEOUS OBSERVATIONS.

SECT. I.—SOCIETIES.

THE ardour for improving arts, and perfecting science, has given birth to many excellent institutions in this county; by means of which the interests of mankind have

have been eminently promoted, and the sphere of human knowledge very considerably extended. In adverting to these establishments, we cannot fail to discern the astonishing efficacy of opulence and patriotism *united* for the public good; while at the same time we may form a very just ground of confidence, that the same means will still continue to be exerted for the encouragement and support of every subsequent plan which may be offered, tending to promote the same beneficial purposes.

We have already Societies for the promotion of most branches of human learning, and for the encouragement of many of the arts; but as it will only be necessary to particularize such as have a more immediate relation to, and connexion with, the improvement of agriculture, I shall confine my attention to the two following, viz. the Society for the Encouragement of Arts, Manufactures, and Commerce, and the Veterinary College, both of which are eminently serviceable to the agricultural world. The first in order of time, is

THE SOCIETY FOR THE ENCOURAGEMENT OF ARTS, MANUFACTURES, AND COMMERCE,

Instituted at London in the year 1754, on the most disinterested principles, and actuated by the most liberal and generous motives; its main object being the universal benefit of mankind, though with a very praiseworthy attention to the particular and individual interests of Great Britain. This Society has, by its fostering care of, and unwearied attention to, the arts and artists of every description, and by a well-judged and impartial distribution of reward and encouragement to the ingenious and deserving in every country, rendered the most essential services to this kingdom, and bestowed the most permanent bless-

blessings on the world in general: and has therefore very justly merited, and no doubt possesses, the thanks and good wishes of every true lover of his country, and every sincere friend to human kind.

The benefits and advantages necessarily flowing from an establishment of this kind, originally founded on principles so eminently calculated, from their general usefulness, to promote the purposes intended, becoming more generally known, by means of the annual publication of a volume, containing some of the more important transactions of the society, have very probably been instrumental in the establishment of many useful institutions. From such sources, it is very fair to expect that the most essential blessings will be derived to the inhabitants of this, and other nations.

Among the many objects that arrested the attention, and claimed the notice of this Society, we shall not be surprised to find that improvement in practical *agriculture*, should appear to it an object deserving its most serious regard and encouragement; with a view not only to clear away the obstacles which prejudice seemed to throw in the way of improvement in that particular branch of science, but also to call forth that energy and exertion at all times so necessary to the attainment of any particular object which seemed to be less felt by the professors of that art, than by those of any other. Accordingly, we find that they directed their early attention conspicuously to *this object*, and extended their premiums and bounties to candidates in this class, rather largely; and very extraordinary effects, in particular instances, were the consequences.

I should perhaps have entered more at large into the particular merits of this society, did I not consider myself in some measure precluded by the very general circulation of

of the volume before alluded to, which renders it unnecessary for me to enlarge on the subject. Suffice it therefore to say, that the improvements brought about through the means of this Society, are incalculable!

THE VETERINARY COLLEGE.

The neglected and degraded state of farriery in Britain, had been long seen and regretted by many intelligent persons; but no means were publicly taken to promote the cultivation of this useful branch of knowledge, until the Odiham Agricultural Society, very much to its honour, began to interest itself in the business, in the year 1789, by circulating printed copies of their resolutions, in which it was observed, 'That it was much to be lamented that there was not yet in England any establishment adequate to the desired improvement in farriery, by a regular education in that science, on medical and anatomical principles.' And in addition to this, they repeated their former* intention, of sending two or more young men to France, to be instructed in that art, as soon as they should be enabled to do so by subscriptions or benefactions for that purpose.

Early in the same year (1789), Mr. SAIN BEL, an eminent professor, arrived in this country, and published proposals for giving a course of lectures on the construction of the horse, the diseases of that animal, and of farriery in general; and in the following year (1790), he presented to the public a plan for the cultivation and improvement of Veterinary medicine. This plan was transmitted to the Odiham Society, and appearing to them to be calculated more speedily to effect the improvement of

* This alludes to a resolution which this Society had come to the preceding year.

farriery,

farriery, than their intended plan of sending young men to France, their Committee held several meetings in London, where they were joined by other gentlemen, and the most advisable means ascertained, of permanently *establishing* the Professor's plan. On the 18th February 1791, they resolved, that from that day forward the meeting, or society, should be called the *Veterinary College, London.* Mr. SAIN BEL was, very properly, appointed Professor to the College; and on the 4th of January 1792, he commenced his lectures. There were then four pupils in the College, and the Society consisted of 204 members. On the 18th February 1793, the members of the College were increased to 910, and the number of pupils to 14. The number of diseased horses in the infirmary was 50.

At this time (December 1797) the number of annual subscribers is about 600, and of life subscribers 100; of pupils in the College 32; and of diseased horses in the infirmary 44; but they can accommodate 52. Fifty pupils have been examined and approved of by the medical board.

Such has been the origin and progress, and such is the present state, of this valuable institution.

As the proper treatment of distempers in horses and other cattle, on true and fixed medical and anatomical principles, is undoubtedly of high importance, it is peculiarly incumbent on the nation to protect and support a Veterinary School, in which their anatomical construction may be properly ascertained; the diseases to which they are liable, carefully inquired into; and the remedies proper to be applied, systematically taught. Such an institution cannot fail of becoming generally important to the nation, as every part of it will gradually enjoy the advantage of possessing enlightened practitioners, regularly bred to the Veterinary science, on whose skill and attention they may securely rely.

SECT.

SECT. II.—HERIOTS.

THE manerial custom of taking, at the death of a copyholder, the best beast, and, in some manors, the best piece of furniture, is a barbarous usage, which ought to be abolished.

A favourite horse, or valuable piece of painting, ought not to become the property of the lord of the manor on the death of his tenant. In justice and decorum, they should go to the executor, whereas, as things now are, they are taken by the lord of the manor, even in cases where there are not effects to pay the debts of the deceased. And in every case, they are taken at a time the most distressing to the parties thus bereaved of their property.

SECT. III.—WEIGHTS AND MEASURES.

AVOIRDUPOISE weights are the only ones used in this county for the produce of the soil. Of butchers' meat 8lb. are a stone; of potatoes, a bushel is 56lb.—for more, see Hay and Straw Markets, page 546.

The Winchester bushel, containing 2150 42-100ths cubical inches, is in general use.

Wood is sold by the stack, packed 3 feet by 3, and 12 feet long; thus containing 108 cubical feet.

The court leets within this county appoint ale-conners to inspect the weights and measures. Generally, the lower shop-keepers, or publicans, are appointed: these persons have their own business to mind; few of them are furnished with standard weights and measures; they visit the dealers in provision once or twice a year, having previously

viously given the beadle a few days notice. The beadle is in fee to let the shop-keepers know the day; he then attends at the time, fully dressed in his heavy great-coat (though in the dog days) his laced hat, and large silver-headed staff, with the best weights and measures he can muster. Each dealer gives them about fourpence or sixpence, which furnishes the officers with a plentiful dinner —and all are honest fellows of course!

People of property, who take any care to guard against imposition, measure and weigh every thing as they receive it, by weights and measures of their own; but the labouring poor have no such conveniences. They use the lowest shops, and are generally cheated by false weights and measures, in every thing but bread and beer. Of the latter, indeed, they are particularly careful to see that they have a full pot. In their bread, they generally have half a pound of water in a loaf more than there ought to be, owing to its being insufficiently baked, to preserve its weight. Over the weights of their cheese, butter, and animal food, they have no kind of check whatever.

Every body knows, that the corn measures of the ostlers do not hold more than half the proper quantity, and that their grain is of the worst quality.

Weights and measures require the assistance of the legislature, to shield mankind against numerous impositions; and I think nothing short of stipendary persons required to try their beams, weights and measures, daily, would be equal to the cure.

SECT. IV.—GLEANING AND PILFERING.

In the gleaning of corn during the harvest, the first pilfering acts are committed by the children of cottagers. In

In winter, they gather dead wood from the hedges for firing. Then turnips, and other roots, from the field; fruit from the orchards and gardens; and being further encouraged both by the language and example of the bad people around them, it soon becomes habitual, extends to articles of greater value, engenders the thought of supporting existence by pilfering, in preference to doing it by labour, contaminates the multitude, and makes many commence thieving as a profession.

Mr. COLQUHOUN says, very truly, that every good man who loves his country, and glories in its prosperity, will speedily perceive that this prosperity can only be of short duration, if public morals are neglected, if no check is given to the growing depravity which prevails, and if measures are not adopted to guard the rising generation against the evil examples to which they are exposed.

SECT. V.—DOGS.

THIEVES of every description keep dogs, frequently of the bull-dog kind. They discover, and give their master notice, when any person is in the way, who might interrupt him either in committing the theft, or in his carrying off the plunder. Thus all the gipsies, and persons who live in tents under hedges, by an union of begging and thieving, are always accompanied by dogs, many of which are as great thieves as their owners, and are as regularly taught to hunt with as much avidity as spaniels and pointers after game, round respectable looking houses for small articles of clothes, and other things, which they carry to their masters.

It is obvious, that every man whose labour is insufficient for the support of his family, and who keeps one or

more dogs, must do it to assist him during the time he is committing depredations.

The exemption of dogs of the foregoing description from the lately imposed tax, operates as a license for thieves, as they could not carry on their present depredatory system without the assistance of these animals. It also encourages the worrying and destroying of many sheep, and is the principal cause of canine madness.

Useless dogs are the greatest nuisance imaginable. Canine madness has produced so many lamentable effects, that a remedy is loudly called for. The safest remedy would be to reduce the number of dogs. Not one instance in a hundred is made public, of the persons who die by canine madness in Britain. There are some hundreds who thus perish every year. If all such cases were regularly published in the newspapers, or otherwise, they would touch the hearts of the people so very sensibly, as to produce the annihilation of dogs.

The industrious poor ought not to be allowed to expend their earnings on any thing so useless to them as dogs; many there are, whose dogs have cost them the price of a cow. Their saving in dog-keep might, and ought to be, more prudently employed in the keeping of bees, poultry and pigs. With a little management, these things would produce a cow whose milk would feed their children*.

---

* Since the foregoing sentence was written, Mr. GEORGE BARRENGER, of Tulsehill farm, Lambeth, has lost upwards of fifty pounds' worth of sheep and swine, that died mad; the effect of having been bitten by a dog. Mr. B. observes, that every fellow who lives in a cellar, a garret, or on a common in a tent, and that does not pay any taxes, can keep a couple of bull-dogs, who occasionally mangle a farmer's stock, while the husbandman is not allowed to keep a dog even for the protection of his family, and cattle, without being taxed for it.—*J. M.*

SECT.

SECT. VI.—VICTUALLING-HOUSES.

THE number of public-houses *within* that part of the bills of mortality which lie in the county of Middlesex, are 4,621

Ditto in Surrey 943

Total 5,204

public houses within the whole bills of mortality. There are about as many in this county; as those added for Surrey, are nearly equal to all such parts of this county as lie beyond the limits of the bills of mortality.

The ale and porter sold yearly at such houses, is stated to be 1,132,147 barrels, which, at *5d.* per quart, *3l.* per barrel, amounts to ..... £.3,396,441

Gin and compounds, three million gallons, at 10*s.* is ..... } 1,500,000

Together ..... £.4,896,441

It is supposed that upwards of three millions of this money is expended by the labouring people only; which is upwards of 25*l.* a family on that description of persons.

'An ill-regulated public-house is one of the greatest nuisances which can exist in civil society: through this medium, crimes are increased in an eminent degree; its poison spreads far and wide. It may truly be said to be a seminary for rearing up rogues and vagabonds.'

Supposing each of those houses to ruin one family every five years, or one person every year, it amounts to 5204 persons annually; and in less than twenty years, the numbers are 100,000; which number I suppose are ex-

amples of the great distress brought upon mankind by the victualling-houses of one county only.

Many small country villages can date the commencement of poor-rates from the introduction of public-houses, which corrupt the morals, impair the health, impoverish and reduce the poor to the greatest penury and distress: 'they also encourage idleness, promote begging and pilfering, and are the remote cause of murders and executions more or less every year.'

Patriotism may make the most fanciful designs, and liberality support institutions of the highest expense for 'bettering the condition of the poor,' and when these friends of mankind are nearly on the point of persuading themselves that 'poverty shall sigh no more,' some fiend will open a public-house among the persons apparently rescued from distress; this will undo in two or three years all the good that the best men could bring about in twenty.

SECT. VII.—VERMIN AND GAME.

ESTIMATE of the damage done by vermin on a farm of two hundred acres, one half of it arable, the other in grass, without sheep-walks.

	£.	s.	d.
Mole-catcher paid by the year one guinea: notwithstanding which, they will do damage to the amount of half a guinea	1	11	6
Rat-catcher paid by the year two guineas, and they will do damage to the amount of a guinea more	3	3	0
Carry forward	£.4	14	6

Brought

	£.	s.	d.
Brought forward	4	14	6
*Mice**, if a vermin-killer be employed, will cost as much as for rats, and the remaining damage will be as great, namely, three guineas. If they are not so destroyed they will do in the buildings, corn-stacks, barns and fields, twenty pounds worth of damage	3	3	0
Sparrows, and other small birds, employ five boys to keep them off fifty acres of corn: a fortnight at sowing-time, and another at harvest, with powder, rattles, &c. five guineas. They damage thatched buildings all the year; they are also mischievous in the gardens, to the amount of one guinea more. In this county, they quit London, and the other towns, villages and single houses, and attack every corn field in flocks of thousands together. If not kept off by rattles, &c. they would clear whole fields; but under the best management, their damage amounts to upwards of one shilling an acre on the whole farm—I shall only say	5	5	0
Sparrows feed on both animal and vegetable diet, doing good by reducing the number of grubs, caterpillars and butterflies; and much			
Carry forward	£13	2	6

* In the winter of 1796-7 mice ate the outer bark of the ash and crab in many of my hedge-rows: and, what I had not before observed, there was a mouse track through the centre of a large hay-stack. They had been uncommonly numerous the preceding summer. There was much frost and snow during the winter, and in the subsequent year they were not more numerous than usual.—*J. M.*

	£.	s.
Brought forward	13	2

harm by destroying the blossom of cherries and gooseberries, and the ripe fruit and pease in our gardens, and the corn in our fields.

The fields must be watched against *rooks*. The boys employed in keeping off sparrows, jays, and pigeons, will in a great measure keep these off, and the little damage they do about the time of harvest, is much more than made up to the farmer, by their feeding on worms, slugs, and grubs all the rest of the year.

Jays are particularly destructive to bean crops near harvest time; *pigeons* are so to tares, both at sowing and at harvest time. Twenty-five acres in two fields will require two boys a month with rattles, powder, pistols, &c.	1	1
Magpies, carrion-crows, ravens, kites, hawks, and dogs: every good farmer would be glad to insure against damage by these creatures at	2	2
Game is supported by feeding on all the farmer's crops: he is not allowed to destroy it if unqualified; and if qualified, it will cost him three guineas for a license, and one guinea in ammunition, and still, damage will be done to the amount of one shilling an acre, or ten pounds. Hunters and shooters are a larger species of vermin, who prey upon game; and on an average of years, damage such a farm to the amount of upwards of ten		
Carry forward ..... £.	16	5

Brougl

	£.	s.	d.
Brought forward	16	5	6
pounds; together twenty pounds, or two shillings an acre for the article of game	20	0	0

'The breeding, rearing, turning loose, and cherishing mischievous animals, make part of the employment of every fox-hunter, which he does to the manifest detriment of the farmer and of the community, merely for the wanton sport and fictitious glory of destroying them afterwards, in a manner that aggravates the injury done to the defenceless and disregarded husbandmen. Hunting in a well cultivated country, is an expensive system of barbarity exercised in destroying the property and torturing the feelings of a valuable class of men. A true sportsman is not studious how to put a speedy end to the sufferings of the animal he pursues, but in what manner to prolong its terror, until it has tried all the efforts agonized nature can dictate, and until the utmost exertions of its strength is painfully exhausted. His mode of destruction is beyond brutal, it is filling up the measure of cruelty to its utmost limits*.'—*M. R.*

The earth-worm, the wire-worm, the grub

	£.	s.	d.
Carry forward	£.36	5	6

* The Earl of EGREMONT, whose merits towards the rural economy of his country, were, before, very great, has lately sold or given away his fox-hounds, on account of the injury which he could not avoid perceiving, that the hunting unavoidably did to the labours and enclosures of the farmers in his neighbourhood.

	£.	s.	d.
Brought forward	36	5	6
of the cockchafer, the slug, the turnip fly, the black canker caterpillar, the black insect which destroys beans, and the yellow maggot which feeds on the ears of wheat, are of numerous families, and not less mischievous than any of the foregoing. They will once in five years, cut off the turnips, and once in ten the clover and tares, and do four shillings an acre damage to the corn crops. These losses on an hundred acres of arable land, amount to twenty pounds a year, but I shall include damage done by them to the whole farm, and say only	13	14	6
	£.50	0	0

The worms and slugs who feed on the new roots of corn, &c. may probably be mostly destroyed by a clean fallow, continued so long as to occasion their deaths by want of food. It is probably a mistaken notion, that lime, spread in such quantity as to be beneficial to the soil, will destroy these reptiles. In Kent, near the chalk-hills, and even on a calcareous soil, they lime frequently, and very liberally, without being at all relieved from the ravages of worms. The earth-worm feeds on herbs, and as its size is much larger, so it is probably more destructive than the wire-worm.

Thus the amount is fifty pounds a year, or near five shillings an acre, on the whole quantity of land; which sum will perhaps average the cultivated corn and grass-land farms of Britain; and as there are nearly forty millions of acres in this state, these depredations amount to ten millions per annum.

SECT.

SECT. VIII.—SKETCH OF COMPARATIVE HUSBANDRY.

THE Norfolk farmers have the merit, in common with the farmers of the south and west country downs, of cultivating a small portion of their land in a very superior style; but, as an extensive district, the general cultivation of Norfolk is yet far behind even the *South Downs*, for *there* you are not disgusted with the sight of boggy moors, nor furzy pastures, such as you frequently meet with in Norfolk*. And it is still further removed from the *west country* downs, *where*, in addition to the general clean face of the country, the quagmires are converted into luxuriant water-meadow. Even these do not come up to the Leicestershire husbandry, where they do not employ sheep as dung carriers, for the purpose of impoverishing two-thirds of their land in order to enrich the other, but, on the contrary, cultivate the whole, and, by dividing their farms into moderate sized fields, and by raising good hedges, to afford shade from the scorching heat of the sun in the dog days, and shelter from the nipping frosts in winter, have prepared the way for improvement in live stock, in which they have already arrived at a degree of perfection altogether unrivalled; and both soil and cattle are confess-

* In Norfolk, the traveller is every where offended with the appearance of the boggy marshes, fens, and (what are provincially called) broads, and by extensive districts of uncultivated upland, clothed with heath and furze. The greater part of these marshy bottoms and fens might be drained completely without the help of machinery, and the rest might be laid dry by the aid of fen mills. I have no doubt but that even some of the broads might be embanked, and reduced to inland navigations, by the system of mill-work; and much land might be obtained from the other broads in the same manner.—*J. M.*

edly

edly more highly conditioned than those of any of the foregoing districts.

The Leicestershire husbandman, though standing very high in the scale of perfection, is much exceeded by the very superior management of the meadow and arable farmers, and likewise by the fruit and kitchen gardeners, of this county; since there is not any land in Middlesex (the commons excepted), from the well protected, and healthy copses at Ryslip, to those wonders of their kind, the gardens at the Neat-houses, but what is cultivated, and for the most part, raised to a great degree of fertility.

SECT. IX.—SUPPLY AND CONSUMPTION OF GREAT BRITAIN.

THE excess of the imports, over the exports, of corn, shew clearly, that the annual consumption of this country, in that article, has been greater than its produce, on an average of five years, ending at Christmas 1794, by quarters of

Wheat and flour,	182,021
Barley and malt,	66,455
Oats and oatmeal,	826,061
Rye,	29,799
Pease and beans,	41,248
The whole of the annual average imports exceeded the exports by	1,145,584*

* Extracted from the Parliamentary Reports.

Ditto

Ditto for five years ending at Christmas 1799:

Wheat and flour,	469,966
Barley and malt,	33,851
Oats and oatmeal,	618,643
Rye,	44,899
Pease and beans,	23,772
The whole of the annual average imports exceeded the exports by	1,191,131*

The average of the said ten years was an annual deficiency of 1,168,361 quarters of grain; to which if we add the year 1800; the particulars of which are given in pages 568, 569 and 570, which amounted to 2,269,364 quarters of corn, we shall discover that the average of the eleven years was annually 1,268,452. This quantity is equal to the bread corn of nearly as many persons; or to the entire produce of (in acres of land) ..... 423,000†

Proportion of fallow, one-fourth of the last number,	105,500
Clover and root crops ditto,	105,500
Land to support the requisite number of labouring cattle, to till the deficiency of arable, and to produce food both in corn and hay for their own support; one horse to every twenty acres, and allowing them to require four acres each, is in acres	156,000
Together	790,000

Brought

* Extracted from the Parliamentary Reports.

† The average quantity and price of all sorts of grain, may be thus found, viz.

				£.	s.	d.
Wheat,	$2\frac{3}{4}$ acres,	at 2 qrs. per acre,	is $5\frac{1}{2}$ qrs. at 46s.	12	13	0
Barley and rye,	$\frac{3}{4}$ of an acre,	at 3 qrs. per acre,	is $2\frac{1}{4}$ do. at 30s.	3	7	6
Oats and beans,	$2\frac{1}{2}$ acres,	at 4 do.	is 10 do. at 21s.	10	10	0
	6 acres		$17\frac{1}{4}$ qrs.	£.26	10	6

Divide

Brought forward	790,000
Hedge-rows, scite of buildings, yards, roads, ponds, gravel-pits, &c.	70,000
Allow for inferiority of quality between commons and old enclosures; one-fifth of 790,000, is 158,000, but say only	150,000
	1,010,000

The whole deficiency during the said eleven years, was not less annually than all that could be grown by cultivating our commons to the extent of one million of acres. The miserable consequence of which was, that, notwithstanding we imported food from wherever it could be obtained, the dearth became so great as to occasion the death of about a hundred thousand inhabitants. The present system of passing local acts, every sessions of parliament, for enclosing a few thousand acres of waste land, is altogether unequal to the task of warding off the return of dearth, or to keep down the price of provision; owing to human beings increasing in a much greater proportion.

Mr. CLAUD SCOTT, the most eminent corn merchant that ever lived, laid an account before a Committee of the House of Lords early in the year 1797, by which it appears that for three years, ending the 5th of January in that year, there were paid to foreign nations for grain imported into this kingdom the following sums, namely,

---

Divide 17¾ quarters by 6 acres, gives a bare 3 quarters per acre; and divide 26*l.* 10*s.* 6*d.* by 17¾ quarters, gives a bare 30*s.* per quarter, *i. e.* 3 quarters at 30*s.* is a full average of the corn, exclusive of the straw, seed, and waste.—For the proportion which the number of acres bear in each sort of grain, see page farther on.—*J. M.*

In

In 1794 was paid	£.1,983,856
1795 ditto	1,535,672
1796 ditto	3,926,484
In the three years was paid	7,446,012
Average annually	£.2,482,004

My opinion perfectly accords with the language of Lord CARRINGTON, who, on quitting the Chair of the Board of Agriculture in March 1803, said, "If, after the experience of more than twenty millions sterling having been sent to foreign countries for the purchase of grain, within the short period of a very few years, the Legislature still can condemn millions of acres, which are capable of every kind of produce, to remain dreary wastes, I can impute it to little less than to a species of infatuation."

SECT. X.—AN ATTEMPT TO ESTIMATE THE QUANTITY OF LAND OCCUPIED BY EACH SPECIES OF CROP:

TOGETHER WITH STATEMENTS OF THE PROBABLE NUMBER OF HORSES AND SHEEP; THE QUANTITY OF ANIMAL FOOD, AND THE VARIOUS PRODUCTS OF THE SOIL; THE WEIGHT AND VALUE OF WOOL; AND THE TOTAL AMOUNT OF AGRICULTURAL PRODUCE.

THE returns lately made to Parliament, prove there are about *nine millions* of inhabitants in South Britain; and the best opinion appears to be, that all those who eat wheaten bread, consume annually eight Winchester bushels of wheat; which includes puddings, pies, confectionary, and every other application of wheat in the article of food. This quantity of wheat is about equivalent to the average

net

net produce of half an acre of land; that is, after deducting seed, loss by vermin, accidents, &c. from the gross produce, the remaining net quantity is sixteen bushels per acre.

Those persons who eat bread made from spring-corn and rye, will in like manner require the net product of *half an acre*; as the flour of this sort of grain is so much deficient in quantity, weight, and nourishment, as fully to balance the greater number of bushels per acre in the produce: therefore, as half an acre supplies bread for one person,

	Acres.
Nine million inhabitants consume the corn which grows on	4,500,000
2dly, *Beer.*—A family of six persons, of all ages, require 24 bushels of malt annually; which, at the usual proportion of nine to eight, is rather more than three bushels and a half of barley to each person; but as there are many who do not drink malt liquor at all, this would be too large an allowance for all England and Wales: therefore I shall estimate it at three bushels each, which, for the whole population, is twenty-seven millions of bushels, or 3,375,000 quarters of barley; and that, at the average crop of three quarters per acre (after allowing four for seed, &c. see Barley) is, in acres, - - -	1,125,000
Distilleries.—In the whole of Great Britain, rather upwards of half a million quarters of barley are used in this manufactury, which, divided by three, reduces them into 165,000 acres; from that number deduct 15,000 for Scotland, and the remainder for England and Wales is about - - - - - - - - - -	150,000
Beer and *Spirits Exported*, the produce of - - -	35,000
Starch, hair-powder, and other manufactures, - - -	70,000
Corn consumed by oxen, sheep, hogs, poultry, rabbits, &c. the produce of - - - - - - - - -	40,000
Horses—Consume corn to the amount of the produce of from one and an half to three acres each, or, on the average, two acres.	

Arable

		Horses.	*Acres.*
Arable land employs about one horse to every fifteen acres, which, on 15,000,000 acres, is -		1,000,000	
Grass-land employs one horse to every 100 acres, which, on 20,000,000, is - - -		200,000	
Number of horses used in agriculture, - -		1,200,000	
Horses kept for pleasure, and taxed,	200,000		
Post-chaise horses, mail-coach horses, stage-coach horses, hackney-coach horses, &c. supposed to be about	100,000		
Horses used in waggons and carts, in mills, canals, and navigable rivers, in caravans, and for all the other purposes of draught not before described, - - - - -	240,000		
Cavalry, of all the various descriptions,	60,000		
Number of horses not used in agriculture proper,		600,000	
Total number of horses, - - - - -		1,800,000*	
Which, at two acres each, will consume the produce, of arable land, - - - - - - - - -			3,600,000
Land cropped with turnips, carrots, parsnips, cabbages, and potatoes, coriander-seed for the brewers and druggists, canary-seed for birds, and with dyers', physical and culinary herbs; cultivated by the plough, - -			1,500,000
Clovers, rye-grass, &c. one year's lay, in the proportion of one-tenth, - - - - - - - -			1,500,000
Fallow—In the proportion of two-tenths, - - :			3,000,000
The consumption of the country requires, in aration,			15,520,000
But we import corn proportionate to the produce of upwards of			520,000
Which deducted from the foregoing number, leaves the quantity of arable land in South Britain rather under			15,000,000

In order to discover the quantity of land cropped with

* I applied at the Tax-office, in order to obtain an accurate account of the number of horses which pay the two descriptions of tax; but could not procure it.—*J. M.*

each

each species of grain, I shall adopt the following *hypothesis*, founded on my own observations, made in most of the counties in England, viz. that, including the common arable fields, six-tenths of all the arable land in South Britain is cultivated under the old system of wheat, spring-corn, fallow: three-tenths is in something like the rotation of wheat, turnips, spring-corn, clover: and the remaining one-tenth is in a course of oats, roots, clover.

First position, 6-10ths divided by 3, gives us for fallow 2, wheat 2, oats and beans 2, together - - - - - - -	6
Second position, 3-10ths divided by 4, shews us that the wheat is 0.75, the barley and rye 0.75, the roots 0.75, and the clover, 0.75, together - - - - - - - - - -	3
Third position, 1-10th divided by 3, produces for oats and beans 0.5, roots 0.25, and clover 0.25, together, - - -	1
General proportion, fallow 2, wheat 2.75, oats and beans 2.5, barley and rye 0.75, roots 1, clover 1, together - -	10

According to this statement, every ten million acres of arable land is cropped in the following proportions, viz.

Wheat, ...	2,750,000 acres.
Oats and beans, ...	2,500,000
Barley and rye, ...	750,000
Roots, ...	1,000,000
Clover, ...	1,000,000
Fallow, ...	2,000,000
Total	10,000,000 acres.

By which also it appears, that the corn-crops, including beans, are in the proportion of six to ten; the green crops in that of two to ten; and the fallow, of two to ten.

Having before shewn that there is at most fifteen million

lion acres of land in aration in South Britain, I only have to increase the said numbers one half, and the produce will shew that the soil of England and Wales is annually cropped with the following quantities of each kind of grain, &c. thus:

	Acres.	*Acres.*
Wheat,	4,125,000	
Barley and rye,	1,125,000	
Oats and beans,	8,750,000	
Clover, rye-grass, &c. one year's lay,	1,500,000	
Turnips and other roots, as aforesaid,	1,500,000	
The arable land producing at least one crop annually, is	12,000,000	
Fallow, as aforesaid,	3,000,000	
Together,		15,000,000
Hop-grounds.—The produce of the two years 1772 and 1773, was nearly 8000 tons annually, therefore we may call that the consumption at that period. The next clearing year was 1787, being a period of 14 years; and the average produce of these 14 years was 8937½ tons, and there never was remembered a greater scarcity than at the coming in of the growth of 1788; so that the consumption from September 1774 to September 1788, must have increased from 8000 tons to 9975 tons, otherwise the average product of 8937½ tons could not have been consumed. The average produce of 13 years, ending with the year 1800, has been 9668 tons; therefore the consumption in this latter period must have decreased 307 tons, and they are now much more on the decline, as drugs are used for the purpose of curing beer, in lieu of hops,		35,000
Nursery-grounds about		10,000
Fruit and kitchen gardens cultivated by the spade,		80,000
Pleasure-grounds (the dressed and unprofitable parts only: the rest being either pastured by cattle, or mown for hay) plantations, belts, and clumps,		25,000
Carry forward,		15,120,000

	Acres.
Brought forward, - - - - - -	15,120,000
Land depastured by cattle; lays of more than one year; meadow of natural grasses, meadow of sown grasses, and water-meadow and orchards on grass-land, which includes the cider countries*, - - - - -	20,000,000
Hedge-rows, copses, and woods, - - - - - -	2,000,000
Ways, waters, and yards, the scite of cities, towns, villages, and other buildings, - - - - - - -	1,980,000
Cultivated Land in England and Wales, - - -	39,100,000
Commons and waste land, - - - - - - -	7,816,000
Total in England and Wales, - - -	46,916,000
Horse-food equivalent to 1,800,000 horses, at 4 acres each, is	7,200,000
Fallows, - - - - - - - - - - -	3,000,000
Ways, water, buildings, &c. - - - - - -	1,980,000
Pleasure-grounds, - - - - - - - -	25,000
Manufactories, vermin, damp, must, &c. - - -	80,000
Nursery-grounds, - - - - - - - -	10,000
Hedge-rows, copses, woods, - - - - - -	2,000,000
Druggists' physical herbs, roots, &c. - - - - -	10,000
	14,305,000
Commons, - - - - - - - - - - -	7,816,000
Together, - - - - - - -	22,121,000

to be taken from 46,916,000 acres, the quantity of land in England and Wales, leaves 24,795,000, whereof the produce is consumed by human beings in the proportion of two acres and three-fourths each. By attending to the preceding part of this account, it will appear that it is divided in the following proportions, namely, for bread half an acre; for liquids one-eighth of an acre; for animal food, near two acres; and for roots, greens, and fruit, &c. one-eighth of an acre.

No person will expect any of these quantities to be mathematically true, particularly as we have no maps of

* This quantity of grass-land includes parks, paddocks, and pleasure-grounds, that are either mown for hay, or grazed by cattle.—*J. M.*

England

England that can be depended on, for the purpose of ascertaining the quantity of land, not even, perhaps, nearer than eight in ten of the actual quantity. This sort of calculation is only meant to furnish the mind with some general ideas respecting England and Wales.

ANIMAL FOOD.

There are annually sold at Smithfield-market, about 100,000 *bullocks* and 700,000 *sheep*. There are many sold at several of the towns and large villages near London, of which no account is taken, perhaps equal to the supply of Southwark, and all the places out of this county that lie within five or ten miles of town, consequently the inhabitants of this county consume nearly as much animal food as is sold at Smithfield.

For Middlesex.

	Stone.		£.
100,000 beasts, at 100st. of 8lbs. each, is	10,000,000	at 5*s.* is	4,250,000
700,000 sheep, at 10st. each, -	7,000,000		
Lambs 2½, calves 2½, hogs and pigs 2, together - - - -	7,000,000	at 6*s.* is	2,100,000
Poultry, game, and fish, 5-10ths; dairy 6-10ths, - - - -	1,100,000	at 6*s.* is	330,000
Total, - - -	25,100,000		£.6,680,000

which divided amongst 818,129 inhabitants, is 30 stone and 5lbs., or 245 pounds, which costs upwards of 8*l.* 8*s.* each person.

For England and Wales.

	Stone.
1,000,000 bullocks, at 90 stone each, is - - -	90,000,000
9,000,000 sheep, at 9 stone each, is - - - -	81,000,000
Lambs 8, calves 8, swine, fish, poultry, game, and dairy 24; together - - - - - - - - -	40,000,000
Total, - - - - - - - -	211,000,000

 which,

which, at 4*s.* 6*d.* a stone (offal included in the price, but not in the weight), amounts to 47,450,000*l.* sterling per annum; which being divided among nine millions of inhabitants, is twenty-three stone three pounds and a half, or one hundred and eighty-seven pounds and an half; and being priced in the same manner, amounts to 5*l.* 5*s.* 5*d.* per head, the meat nearly to 3 lb. 10 oz. per week for each person.

WOOL AND MUTTON.

It was given in evidence, on passing the last wool bill, that the clip of England and Wales amounted annually to about 600,000 packs, of 240 lbs. each, or 144,000,000 of pounds, which sell at 10*d.* per pound, and produce 6,000,000*l.* sterling.

The mills and machinery employed in the woollen manufactory are supposed to have cost six million pounds sterling, and the manufactured goods produced from the wool are said to be worth eighteen millions, whereof are exported annually to the amount of six millions. I take the average yield of each sheep to be a small fraction more than 4 lbs. by which divide the whole quantity of wool, and it shews that we have, of stock sheep, 35,000,000. I apprehend they consist nearly of,

12,000,000	breeding ewes, which bring as many lambs. The former are killed off at an average of five years old, or annually, - - - -	2,400,000
23,000,000	other sheep which are killed off at an average of three years, or annually, - - - -	7,600,000
35,000,000		
	Total number of sheep killed annually, -	10,000,000
	Lambs slaughtered, - - - - - - - -	2,500,000
	Lambs and sheep die carrion (principally from the rot) one in twenty-five of the last two numbers, - -	500,000
	Yearly increase and decrease, - - -	13,000,000

The

The mutton, taken at nine stone per sheep, and the lambs at five, gives 100,000,000 stone as the yearly consumption.

ANNUAL PRODUCE OF THE AGRICULTURAL CAPITAL OF ENGLAND AND WALES.

12,000,000	acres of arable land in crop annually, at 5*l.* is	£.60,000,000
35,000	—— of hop-ground, at 34*l.* is - - -	1,190,000
10,000	—— of nurseries, at from 50*l.* to 100*l.* say at only 50*l.* is - - - -	500,000
50,000	—— of garden-ground cultivated by the spade, from 50*l.* to 100*l.* say at only 60*l.* is	3,000,000
25,000	—— of unprofitable pleasure-grounds, which cost a quarter of a million in labour, and return nothing.	
20,000,000	—— of grass-land, at 3*l.* is - - -	* 60,000,000
7,816,000	—— of commons, - - - -	* 1,000,000
2,000,000	—— of woods, copses, and hedge-rows, at 10*s.*	1,000,000
1,980,000	—— of ways, water, and buildings, nothing.	
3,000,000	—— fallow,	
46,916,000	acres, the whole quantity and produce, -	126,690,000
	Which costs in labour, artificers, and horse-keep, -	56,690,000
	Remains net increase in value on the produce of the land per annum, - - - - - - - -	£.70,000,000

Of which the landlords take 42
The state, in taxes and tithes, ... 13
And the farmers are permitted to share the remaining 15 which is all they receive in return for interest of capital, skill, industry, and attention.

---

* This part of the account might be varied, by stating the amount of animal food at - - - - -	40,000,000
The wool, at - - - - - - - - - -	6,000,000
The tallow, skin, bones, &c. at - - - - -	10,000,000
Fed by horses, &c. - - - - - - - -	5,000,000
The produce of animals, - - - - -	61,000,000

which is the same amount as in the text.—*J. M.*

If the *manufacturing* and *commercial* part of Great Britain were to be tried by this rule, namely, of sharing less than one-fourth part of their real gains, as appears to be the case with the *agricultural* branch of the community, they could not exist an hour, under what they would term such severe oppression.

CHAP. XVIII.

MEANS OF IMPROVEMENT.

THE following summary will, in some measure, shew that more has been done within the bills of mortality, with a view to benefit and improve the inhabitants, than in any other part of the kingdom.

'There are five hundred and two places of public worship.

'Four thousand and fifty seminaries for education (including two hundred and thirty-seven parish charity schools).

'Eight societies for the express purpose of promoting good morals.

'Ten societies for promoting the learned, the useful, and the polite arts.

'One hundred and twenty-two asylums, and almshouses, for the helpless and indigent (including the Philanthropic Society for the reclaiming of criminal children).

'Thirty

'Thirty hospitals and dispensatories for sick and lame, and for delivering poor pregnant women.

'Seven hundred and four friendly, or benefit societies and institutions for charitable and humane purposes.

'Which several institutions, including the poor's-rate of about 245,000*l.* are supported at the almost incredible sum of 750,000*l.* per annum.'

In this, and two or three adjoining counties, public institutions abound; but there is a great want of economy in most of them. They are, for the greater part, converted into expensive jobs, and furnish luxurious support to a few individuals. There is scarcely a treasurer to any public institution for charitable purposes, who shews any disposition to infuse into the administration of its finances, the smallest portion of that economy which he, properly, exercises in his own private establishment. Even a chaplain to one of them, at this time, costs the subscribers as much as the medium income of a dozen country vicars.

It is generally true of the public institutions in London, that they cannot have more than one-fourth part of their income appropriated to the real object of their being supported. Even Bridewell Hospital expends on the objects of its charity only one-fourth part of its revenue,

or, ...	£. 13,451
In salaries of its officers, ...	19,254
In feasts, ...	3234
In repairing and altering its buildings, ...	17,333
Its whole annual revenue in 1794 was	£. 53,272

'For the administration of justice, there are provided the following courts, offices, &c.

'Thirteen supreme courts.

'Forty-eight subordinate courts, including quarter sessions, courts of request, &c.

'There are seven thousand and forty lawyers practising in these several courts.

'There are fourteen gaols, and five houses of correction.

'Notwithstanding all these, it is a melancholy truth, that vice and immorality are daily gaining strength, and spreading their baneful influence over the inhabitants of this district.

'*Civil Policy.*—The recovery of debts stands in the greatest need of being rendered more easy, speedy and certain; and of being reduced to the least expense possible. According to the present system, if a debt exceeds forty shillings, an action may be brought in a superior court, where, if contested, the expense will, at the lowest computation, be upwards of fifty pounds, and the defendant has it in his power so to manage, as to create an expenditure of several hundred pounds, as well as to occasion a vast deal of trouble and loss of time to the plaintiff. So circumstanced, prudent men suffer great losses by giving up just claims which they may have on others, and paying likewise false bills charged on them by designing people, who avail themselves of the imperfections of the law.

'To convince the reader that this observation is not hazarded on weak grounds, and that the evil is so great as to cry aloud for a remedy, it is only necessary to state, that in this county alone, in the year 1793, the number of bailable writs and executions for debts from ten to twenty pounds were 5719, and the debts sued for amounted to 81,791*l.*

'It will scarcely be credited, although it is unquestionably true, that the mere costs of these actions, though made up, and not defended at all, would amount to 68,728*l.*; and if contested, the expense would be no less than 285,950*l.*

'Between

'Between six and seven thousand persons are arrested annually in Middlesex, one half of whom are for debts under twenty pounds. In the kingdom at large, the number is not less than forty thousand for trifling debts in the course of a year. The unavoidable expense, in money, and loss of time, at the lowest computation, is but little under a million pounds sterling: a most grievous burden, which, on many occasions, sends both parties to a gaol, involving the ruin of themselves and their families.

'The mind is lost in astonishment at the deficiency of this important branch of the jurisprudence of the country.

'Humanity, justice, and policy, plead for the amendment of a system so contrary to reason, and so shocking to humanity*.'

Most of the means of improving practical agriculture, which occur to me at present, are mentioned in the foregoing parts of this volume. In this place I shall, therefore, only add the following observations.

In the progress of evaporation, a vast quantity of enriching particles rise, from every putrid substance, into the atmosphere, especially where the *wind* moves with a quick, or uninterrupted current, as it does on downs, hills, and extended plains; from which it carries off more than it deposits; and thus has a tendency to impoverish such places. In situations sheltered by hills, plantations, &c. stagnant air is produced, which deposits more than it takes up—this difference tends towards enriching low land; consequently, if high and numerous hedge-rows, plantations, and lofty trees, were raised in exposed situa-

* For the foregoing account I am indebted to Mr. COLQUHOUN's admirable Treatise on Police.—*J. M.*

tions,

tions, they would interrupt the injurious current, and procure a milder air, which is more friendly to vegetation.

Improvements in *live stock*, in a great measure depend on first improving the produce of the soil. Plenty of tares, turnips, clover, and cole, may be raised on very ordinary land. They will support the best stock, and, provided the soil be sufficiently dry to bear the treading of cattle in every season, even though the land be either *naturally poor*, or exhausted by *bad husbandry*, a succession of these crops being consumed on it, will rapidly advance it into the productive class.

Mr. BAKEWELL's system of improving *cattle*, should be generally adopted; and, by rearing them on such food as may be produced on enclosed arable land, the live stock of the nation would be made to equal the best at this time.

A similar method of annually selecting the most choice *seeds, roots, and fruits*, should become universal; by which means the improvement in the *vegetable*, would keep pace with that in the *animal*, world.

No downs, sheep-walks, or waste land, should be lett with any farm, except on the express condition of its being brought into the most perfect cultivation.

No tough old sward should be broken up without paring and burning.

Every farmer should raise tares, and then turnips, or cole, in succession in one year, and feed these two crops on the land which produced them, by sheep and cattle; and in the following year grow wheat on the same land: thus having one moiety of his arable land cropped with wheat, and the other fattening herds of cattle and flocks of sheep.

Every proprietor of a large landed estate should occupy one of his own farms, which, he should be careful to cultivate

tivate on the most improved and scientific principles; in this manner he would teach the neighbouring tenantry the best practice, by the most powerful of all means, *example*.

The Legislature ought to interfere, in order to prevent the conversion of timber plants into pollards, and to enforce the cutting down of all the present pollards. This might be so managed as to convert two million acres of hedge-rows into nurseries for growing timber trees. It would also be the means of adding very much to the profit of the land-owner; of increasing the beauty of the country; and of providing the most ample support for our shipping.

Improvements should, generally, be made by the tenants, in consideraton of long leases. This would secure the payment of rent to the landlord, with other advantages.

Any contrivance by which the land could be preserved from deterioration, would be a valuable acquisition both to the landlord and the public. Perhaps an act of parliament should be passed for this purpose, requiring, that on the expiration of every lease, a valuation should be made of the waste committed on the soil, hedges, ditches, and drains, as well as on the buildings; and the amount of such valuation paid by the *outgoing* tenant, to the *incoming* one, if he be expected to restore the state of these things; otherwise it should be paid to the landlord.

Woods and Plantations might be made to contribute to the beauty of the country, to an equable climate, and to the wealth of the nation, by being raised only among rocks, and on such hills, mountains, and other situations, as are unfit for the production of more valuable crops.

The Wastes, which, in their present state, serve only as a resort for robbers, as the seat of agues in man, and of rottenness in sheep, and to keep up a worthless breed of cattle,

cattle, might be advanced, by cultivation, so as to rank with the best land in the kingdom.

Canals being introduced in so general a way as to leave few places more than five, or seven miles distant from one; and the *roads* being kept so clean and hard as to be almost free from every obstruction, would be very important advantages to the nation.

An increasing population (as the greater number of mouths to be supplied will create ready markets) must be friendly to agriculture. Cities, therefore, being the graves of mankind, reduce this demand much below what it would be, if the inhabitants were more equally distributed over the more healthy parts of the kingdom.

Peace, as it usually gives much greater energy to the industry of the inhabitants, is the principal cause of increasing wealth among the middle, and more numerous classes of society, and, consequently, induces a greater consumption of animal food; which will, as certainly, require a larger extent of cultivated ground*. It is self-evident, that, as the wealth of the country increases, the demands on the soil must increase in the same proportion; and these demands cannot much longer be satisfied, without either enclosing and cultivating the waste land, or forcing the industrious poor to perish by insufficiency of food†.

Commerce might be much extended, the number of

---

* 'In times of peace, the busy hand of labour plies the plough, the shuttle, the hammer and the spade. The reward is plenty, rapid improvement in the arts, and increasing population.—*W. P.*'

† Every acre will support its man well, so long as he continues to live on *vegetable food*; but only let him change his diet to one meal per day of *animal food*, and he will require the produce of four acres.—*J. M.*

The children, and others, of the industrious poor, died in this manner during the dearth and high price of provisions in 1800, more than they do in years of tolerable plenty, by at least seventy thousand.—*J. M.*

ships

ships increased, our sailors multiplied, and the wealth of the nation augmented, by carrying the surplus products of the soil to the markets of other nations.

The improvements here enumerated, if properly carried into effect, would *double* the amount of the *agricultural* produce of the nation, and its inhabitants would be increased in the same proportion. On the whole, though they are too considerable in number, as well as in magnitude, to be very speedily accomplished, yet they are certainly attainable; and if the gentlemen who compose the BOARD OF AGRICULTURE, should only be the means of putting them in the way ultimately to arrive at perfection, they will deserve the thanks of every Briton.

That the endeavours of the BOARD will, in the end, be crowned with success, it would be unreasonable to doubt, since we know that the growth of both clover and turnips was at first reluctantly adopted by farmers; and *tares* are still only grown in patches, as clover and turnips formerly were. There is little doubt, however, but that *they* will soon attain the pre-eminence they deserve.

I shall conclude this chapter with advising every agriculturist to make experiments on a small scale at first; as, if they were always so made, and repeated till they proved the utility of the scheme, the party would escape discredit, and avoid the risk, to which a contrary conduct would render him liable, of sustaining considerable loss.

CONCLU-

CONCLUSION.

IN the preceding work I have endeavoured, so far as my information and ability enabled me, to give a faithful picture of the present practice of the county of Middlesex, in regard to Agriculture; together with such observations and remarks thereon, as occurred to me at the time of writing them; in doing which, and in recommending any new system, either from my own experience, or the practice of other persons, I have acted from the full conviction of the utility of such measures, and the certainty of their proving highly beneficial to the nation.

In the discussion of such subjects as may be deemed not immediately relating to agriculture, though in some measure connected therewith, I have endeavoured to confine my remarks to those particulars only that appeared to me most deserving the attention and concern of the landed interest.

I have also, with a degree of earnestness proportioned to the magnitude of the subject, endeavoured to point out some of the most material obstacles to the improvement of agriculture, and throw out a few hints, for the consideration of more able men, towards removing those obstacles. These, I hope, will be received with candour, and with that attention which the interest and importance of the subject itself is more entitled to claim, than the manner in which it has been discussed by me.

I have now only to make my grateful acknowledgments to my excellent friend WILLIAM BRAY, Esq. who kindly

wrote

wrote the whole Section on Tenures; to Mr. JOHN RICHARDSON, Mr. THOMAS BAINBRIDGE, and Mr. JOHN TRUMPER, for communicating the quantity of waste land enclosed in Middlesex since the first publication of this work. I am also desirous of returning thanks to

The Right Honorable the Earl of BERKELEY,
LANGFORD MILLINGTON, Esq.
THOMAS S. D. BUCKNALL, Esq.
GEORGE ROSE, Esq. C.P.
Sir WILLIAM GIBBONS, Bart.
ABRAHAM WILKINSON, M.D.
ANDREW REID, Esq.
JOHN LIGHT BANGER, Esq.
R. P. CAREW, Esq.
The Rev. WILLIAM VYSE, LL.D.
The Rev. J. TICKELL,
Mr. JAMES LUCAS, and
Mr. RICHARD CROCKFORD;

for their several communications. An apology is also due from me to PATRICK COLQUHOUN, Esq. and others, for the quotations which I have made from their works.

J. M.

APPENDIX.

No. I.

HOUNSLOW-HEATH.

Copy of an ancient Ordinance, kindly furnished by Sir WM. GIBBONS, Bart. of Stanwell-place, which shews the original rights claimed by different parishes on Hounslow-heath.

THE BILL OF HOUNSLOW-HEATH, 37 HENRY VIII.

WHERE the King's Majestie ys at this present seased one estate of inherytance of the waste grounde and vle comonlye called Hounsloo-heath, conteyning in elf ffower thousand twoo hundryth ffower score thyr- e acres and one roode, lying and extending into the ds, parishes, and hamlets, Istelworth, Braynford, and ykenham, Heston, Feltham', Harlington, Craynfeld, mondesworth, Stanwell, Hanworthe, Bedfounte, npton, Hounsloo, and Tedington, in his Grace's nt ie of Middlesex; his Highnes most prudentlie con- ring, that as the barreness and infertylitie thereof, by nte of dylygence and industrye of men, necessarylye uyred for the amendment or mayntenance of any unde that shall bryng forthe his frute, breadythe as

well scarsytie and lacke of all manner of grayne, graffe, woode, and other necessary thynges, amongs his Grace's subjects thy inhabitance of the said parishes, as also is the veraie oryginall mother and contynual nurs of derth of thyngs amongs his people dwelling in the confynes of the same, even so the conversyon therof into tyllage and sev'al pasture by menys labor and paynes, besids that yt shall be an exile of idlenes in those parties, must of necessyte cause and bring furthe to all his said subjects plantie and habandance of all thyngs above remembred; and albeyt his Highnes myght justelie, by the auncyent lawes of this his realme, approve to his owne peculyar proffyt and advantage a greate parte of the same waste and heath; nevertheless, his Majestye most graciouslye tendering more the common wele of his subjects there than the advauncement of his owne comodytie, hath not alonlie already, to his great costs and charges, caused dyverse of his counsell, and others of his offycers and mynysters, by vertue of his Grace's commyssion in that behalf to them dyrected, to repayre thither, to vewe, survey, and consider, the said wast and hethe, and thereupon to assygn out, by mete and bounds, to every of the said parishes, a convenyent, part and porc'on of the same, and owt of those parts and porc'ons, by lot, to apoynte in severaltye to everye inhabytant within the said paryshes and hameletts suche quantite of the said heathe, as by the dyscrecyon of the said commyssioners was thought mete and convenient, having a specyall regard to the nombre of the inhabytants in every parishe, and to the nombre of acres of hethe lymyted to everye of the said hameletts and parishes; but also is contented and pleased, at the humble petycion and sute of his said subjects, to whom and thair posteritye the commodytie hereof shall specially redounde, that yt be enacted by his Highnes, as hereafter ensythe: Wherefore

be yt ordayned, enacted, and established, by the King, with thassent of the Lordes Spiritual and Temporall, and of the Comons in this present P liament assembled, and by the authorytie of the same that suche parte and so muche of the said waste and hethe whereof his Grace is now seased, or at any time hereafter shall be seased of one estate of inherytance, as shall be at any time hereafter by his Grace's comyssoners, or ffower of them, heretofore named, or hereafter to be named, certyfied under their hands and seals, into his Highnes Court of the Augmentac'ons of the revenues of his Grace's crowne, to be mete and convenyent to be converted, used, or occupied, into tyllage, pasture, meadow, or other severall grounds, shall from hensforth immedyatly be and remayn perpetually copyhold lands, and shall be deamed and adjudged of the nature, qualetye, and condicon of copyhold lande, to all intents, construcc'ons, and purposes. And that every tenente, inhabytant, resyante, and others, their heires, successors, and assignes, and the heirs, successors and assignes of every of them, shall have and enjoye suche ryght, tytle, interest, possession, remaynder, and reversyon, of and in the porc'on and parte of the said wast and hethe, to them or any them by the said commyssyoners assygned, or to be assigned, as shall be by the said commyssyoners, or fower of them at the lest, by copy to them or any of them to be hade and made, declared, or expressed, and the same shall be certyfied in to the said court of Augmentacions under there hands and seales. And be yt further enacted, by the authorytye aforesaid, that all and every tenate, inhabytant, and resyant, and other above remembered, shall immedyatlie after certificat, made as ys aforesaid, bedeamed, adjudged, and taken to be tenate, by copy of court rolle, of the part and porcion

to them, or any of them, as ys aforsaid alloted and granted by copy of court rolle to such manor or lordship being within the said parishes and hamletts, or any of them as the said comyssyoners, or fower of them at lest, uppon the said certyfycat, shall, under thair handes and seales, assigne and appoynte them or any of them unto, and according to the tenor of the copy of courte rolle to hym or them made of the same; and that after assigment and certyficat made as ys aforesaid, the same parts and porc'ons shall be taken, had, and reputed, to all intents perpetuallie, as only members and parcells of the mannor or lordship whereunto they ar so appointed and assigned; and that the stewarde for the tyme being of any such manors or lordshipps, whereunto any part or porc'on of the said hethe or waste, shall be by the said comyssyoners, or ffower of them assigned unto, shall, after certyfycat thereof as ys aforesaid, have full power and authoritye from tyme to tyme, as the case shall justlye requyre, to lett and grant the same, by copy of courte rolle, to any person or persones, to hold the same parts and porc'ons, accordyng to the estate and interests prescribed in thair copees, at the wyll of the lord, accordyng to the custome of the manor or lordshippe whereunto the said party and porcons are as ys abovesaid assigned or appointed to apperteyn; and also, that all customes, usages, condycons, and ordynances, which the said comyssyoners or fower of them at the lest, shall at any tyme hereafter prescrybe, rendre, decree, or make, concerning any parte or parcell of the said wast or hethe, shall be as good, fyrme, and stable in the lawe, beyngg certyfyed under the handes and seales of the said comysyoners, or fower of them at the lest, into the said court as ys aforsaid, to all purposes and effects, as yff thaie and every of them were particu-

larly

larly recyted and enacted by authorytye of this Parlyament. Provyded allwayes, that yf any suche persone or persones, to whom any parte of the sayd waste and hethe shall be alloted, do ether refuse to take by copy of court rolle the parte and porc'on to him alloted, assigned, or letten, or to be alloted, assigned or letten, as ys aforsaid, or ells refuse to convert his sayd part or porc'on into tyllage or pasture, and in suche sorte to improve the same, within such tyme as to hym or them shall be prescrybed or assigned by the said comyssyoners, or fower of them at the lest, that then suche persone and persones as be or shall be tennte for terme of lyf, for terme of yeres, or at wyll, of such messe, cotage, or lande, in respect wherof the said parte and porcon is or shall be alloted or assigned, shall and maye take, have, and receyve of the sayd stewards, the said part and porcon of the said wast, to hold at the will of the lorde, after the custome of the said mannor or lordshippe, for terme of twenty-one yeres; the remainder thereof after the end and determination of the said lease of XXI yeres, to the owner of the said messe, cotage, or lond, to hold to him, his heires, and assignes, at the will of the lorde, after the custome of the said mannor. And be yt further enacted, by the saide authoritye, that yf the said lessee refuse that to take as ys abovesaid, that then any other the King's subjects, borne under his Grace's obedyence, shall and may take, have, and receyve, the same parte and porcon of the said waste, as ys abovesaid, for term of XXI yeres, with remaynder to the said owner, as ys abovesaid. Provided also, that all and everye suche lessee for terme of XXI yeres, as ys abovesaid, shall and maye improve the said parte and porcon of the said waste and hethe to hym letten, by copye of court rolle, during the said XXI yeres, without any interrupc'on of any owner of any such messe, cotage, or

londs, any surrendre, discharge, determinacon, or forfayture, of his or thair interest, estats, or terms, of and in any suche messe, cotage, or londs, notwithstanding.

Signed,

GEORGE ROSE,
Cler. Parliament.

No. II.

Letter from ANDREW REID, *Esq. to the Author, relative to Enfield-chase, and the Enclosure of the Commons near London, urging the Necessity of making them Freehold and Tithe-free.*

SIR,

I AM sorry it is not in my power to answer your queries respecting Enfield-chase, with any degree of accuracy.—Not having any interest in it, and my time being very much taken up in my business, I have not attended to the cultivation of each separate allotment; but from riding over it frequently, I am enabled to state in general terms, that the King's allotment, for the number of acres it contains, is in the worst state of cultivation of any land on the Chase. A considerable portion of it, I believe from one thousand to twelve hundred acres, fell into the hands of a Mr. KAYS, the greatest part of which either lies in its original state, or is in as bad a state of cultivation as it can possibly be; in some instances, hardly growing the seed sown upon it. The South Mims allotment has, in general, been brought into the highest state of culture, and this year bears as fine crops as I ever beheld. Mr. BYNG, in particular, has a farm of chase land, his proportion of Mims allotment, which may challenge some

of

of the best land in the kingdom for the burthen it produces, and for the peculiar good husbandry which is bestowed on it.

It is highly to be lamented, that the valuable commons of England should remain so long uncultivated; but particularly so, that Finchley-common, Hounslow, Epping-forest, and other tracts of very valuable wastes within twelve miles of London, should not be enclosed even by a compulsory act of parliament, if it be found impossible to accommodate all the jarring interests that impede this great improvement in any other way. Finchley-common, with which I am best acquainted, I suppose contains from seven to eight hundred acres, and the greater part of it of an excellent quality. On an average, I presume it would lett at thirty shillings per acre, the tenant being at the expence of enclosing it. At present, it starves a few miserable ponies, and a much larger stock of sheep than it can carry; and in wet summers, many of the sheep die of the rot. The increasing size of the metropolis demands that every acre near it should be brought into a state of active cultivation; and if the clergy, lay impropriators and others, are blind enough to the great interest of the community, and to their own in particular, as to throw obstacles in the way of a general enclosure bill, on the only sound principle on which such a bill can be beneficial, I mean making the new enclosed land *tythe-free and freehold*, a law should pass without loss of time, to compel them. Sir JOHN SINCLAIR's bill I have thought extremely deficient, inasmuch as it leaves the clergy the option of taking such a proportion of the commons as can be agreed upon, or of taking their tithes in kind after the improvement takes place. It also gives a negative to the majority in numbers; and as all the commons round London are depastured by the cattle of the small freeholders

and copyholders, whose proportion of the common, when enclosed, would not be an object to them, it is reasonable to suppose that they would object to an enclosure. Finchley-common in particular, is without stint, and people living in other parishes, taking a field in Finchley, and erecting a hut in that field, where they make a smoke, turn as many sheep on the common as they please; it therefore in such a dry summer as this, becomes of little or no value to any one.

I have said thus much on the subject of the wastes, in hopes that those in the County of Middlesex may form a very striking feature in your improved Report. I most anxiously wish to see them all enclosed, and shall be happy to see you take up the subject in a manner that must convince every man that these commons in particular should be immediately enclosed, free from the trammels which the clergy would impose on their improvement; and, if possible, free from any claims from the lords of manors, to whom an equivalent might be given in land, or in money.

I have the honour to be, Sir,
Your most obedient humble servant,

ANDREW REID.

Greenhill-Grove, near Barnet, Herts,
August 16, 1796.

No. III.

Extract from a Letter from Dr. WILKINSON to the Author, relative to the Cultivation of Enfield-Chase, the application of Chalk, and the superiority of Paring and Burning to every other Method of Tilling this Soil.

SIR,

IN answer to your query respecting the chase, the whole of the enclosed land is now in cultivation, except about 1200 acres belonging to the tenants of the crown.

I have found the fertility of the chase land much increased by the application of chalk and lime. The strong wet loams of this district are rendered dryer and more mellow by the calcareous earth. I have laid on twelve loads of chalk and 160 bushels of lime per acre. They are brought from Cheshunt-common, distant about three miles. In a wet winter, the extent of the lime and chalk might have been easily traced, by the superior vigour and more florid appearance of the wheat. I have likewise found, which is worth remarking, that the harvest was forwardest on the lands which had been chalked and limed. Where I adopted this practice, the crops have been uniformly good in the following succession: fallow, wheat, beans, wheat. My experience carries me no farther, as it is only three years since I began the use of lime.

Should a general enclosure of the waste lands take place, there is no question of more importance than the expediency of breaking up the turf by *paring and burning*. My own experience suggests the following arguments in favour of this practice.

That it saves a very heavy expense in the first breaking up

up of land, when a guinea per acre will not cover the charges of ploughing.

That the burnt clay, acting as a mechanical manure, breaks the stiffness and adhesion of the soil.

That the ashes are found to possess the most fertilizing qualities as a manure; and by this operation are laid on the premises at a small expense.

That by destroying the natural coarse grass which grows up among the corn (unless the turf has been previously burnt), it allows the cultivator to introduce clover in an early course, which would otherwise be choaked in its tender shoots by an abundant spring of grass.

That it secures the first crop from the ravages of the worm, which are found so abundant in the fresh turf.

That so far from ruining the staple of the soil, I have found land thus treated, retaining its fertility for five crops successively, without the additional stimulus of any other manure.

After all, I am ready to admit, that the practice may be injurious, if followed by an injudicious course of crops.

ABRM. WILKINSON.

August 31, 1796.

No. IV.

On Newbury Peat Ashes, in a Letter to the Author.

SIR,

THE ashes are a guinea per hundred in the place. The freight to Kingston, Surrey, will be a guinea and an half more. We dress our clover and new sown grass seeds with ashes, and sow about ten or twelve bushels per acre; they

they will also do for meadow land; I have known them sown on wheat; but they are very apt to blight. They do very well on vetches.

I am your humble servant,

RD. CROCKFORD.

Englefield, Feb. 9, 1794.

No. V.

On Soot, Malt Dust, &c. in a Letter to the Author.

RESPECTED FRIEND,

THE usual quantity of soot sown per acre, as top-dressing, is about forty bushels. I think to increase it to sixty; if land is poor, it may be done with advantage to the crop. The time of sowing, I believe, cannot be better fixed than the latter end of this month, or the fore part of the next; although some farmers are of the mind, that a little later is better, as they believe frost is detrimental to soot; and if land lays much on a descent, it is more liable to be drove away by floods.

The quantity of kiln dust that I make us of, is from fifty to sixty bushels per acre; but generally use it for barley; if for wheat, about the same quantity, and the usual time of sowing is the same as soot. I have sometimes sown malt-dust at the time of sowing the wheat, but in a mild winter it is apt to work too soon; of course leaves off too soon also. I have had but little experience with respect to grass land, but I am of opinion both soot and kiln-dust may be sown with advantage. Have heard that soot made use of on clover, answers very well. I have this year sown three hundred and twenty bushels of soot with the wheat, and ploughed it in at the same time, on

on about six acres of poor land, after a summer's fallow, and new land drained, but cannot see any effect from it at present. The remaining part of the piece is dressed with other manure from London, viz. a part squib, and a part mince-meat, at about the same expense per acre, but appears far the best at present.

Conclude with respects, thy sincere well-wisher,

JAS. LUCAS.

Brickendon-bury,
2d Month, 11th, 1794.

No. VI.

Mode of Fattening Cattle with Molasses. By L. MILLINGTON, Esq. in a Letter to Sir JOHN SINCLAIR, Bart.

SIR,

As you did me the honour, yesterday, to request that I would put down on paper, the substance of some little observations I had made on the fattening of cattle expeditiously, by the addition of molasses to their common food, I now sit down to do so, but with great diffidence. It has been my practice, and pretty generally that of my neighbours, to give from half a pint to a pint of molasses, twice a day, to a very poor ox, that has been worked for ten, twelve, or fifteen years in the yokes, till he could scarcely stand. The mode of giving the molasses is, by putting a gallon of Indian corn, oats, or any refuse or damaged corn, roughly ground, or potatoes, into a pot of boiling water, just enough to form it into a thick mash, or pudding-like substance, called by the negroes in Barbadoes *coscoo*. It is well stirred with a long wooden spoon, till nearly cool, to prevent its burning to the sides of

of the iron pot. When cold, it is made into balls, or lumps, of about a pound weight. Half of these balls is given to an ox morning and evening, dipping each into the molasses, which, after a few days, is eaten with great avidity, and very quickly fattens the ox, with the addition of a little hay, or any green fodder, not too succulent or flatulent. A spoonful or two of salt is generally dissolved in the water. When ground corn is not used, the dry food, such as cane tops, tedded or withered in the sun, dried guinea grass, or oil-cake, is well wetted with the same quantity of molasses, diluted with as much water, and some salt dissolved in it.

With great respect, I am, Sir,

Your obedient humble servant,

LANGD. MILLINGTON.

Berners-street, April 3, 1795.

No. VII.

An Account of a Dutch Dairy. By the Rev. Mr. TICKELL.

SIR,

THE economy of the Dutch, in the management of their milch cows, being recommended in one of the Agricultural Reports, as an object worthy of inquiry, I take the liberty to send you such previous information on the subject, as my cursory notes, made some years since on the spot, furnish me with, on the inspection of three great cow-houses, at Utrecht, Harlaem, and Amsterdam, which were constructed on an oblong square, and of a moderate height, with a slight floor over head, for a certain occasional quantity of hay cut out of a Dutch barn adjoining the cow-house. The building within was airy and

and luminous; its length determined by the number of the cows, which might amount from forty to sixty, or more, and from three to four feet allowed to each cow—its breadth from thirty to forty feet, which may thus be distributed: twelve feet in the centre, between two rows of cows, including a sloping gutter on either side, in the front of, and in a line with, the heads of the cows; five feet on either side for their standing, and immediately behind their tails a gutter two feet wide, and nearly as many deep, and also a four feet walk on either side behind each gutter. The centre walk is paved with clinkers, and kept very clean, and *sanded*, between which and the two sloping channels, paved likewise with clinkers (one in each front row of cows) is a thick board, a foot and half high, fixed edgeways, to keep the hay, &c. on which the cows are fed, within the bounds of the channel. The cows are tied up with a slight chain, or rope round the neck, fastened to an iron ring, running up and down a fixed post; under the standing of the fore and hind feet of the cows, fir timber, a foot and half wide, is extended the whole length of the house (as stone, or any harder substance, would probably founder their feet) and the interval filled up with a floor of sand and lime, gradually depressed towards the middle, the better to receive the incumbent belly of the cow. The timber, on which the hind feet stand, is rather higher than that in front, both to enable the cow to reach her meat the more easily, and likewise to eject her excrements the more cleanly. Each cow's tail is platted, and to promote cleanliness, tied by a slight cord fastened to a narrow slip of deal, nailed above, which prevents their flourishing their tails, but not their lying down.

Their food is hay, with repeated warm messes of grains, boiled turnips, potatoes, cabbage, refuse carrots, oil-cake, buck-

buck-wheat, &c. &c. which are placed before them in the front channel above mentioned, at the upper end of which is fixed a pump to supply them with water, which they drink, as it glides gently down before them in the said channel; and in very cold weather, the pump water is tempered with hot water. In order to remove the excrements in the gutter before-mentioned, a square board, fixed in a long handle, the exact breadth of the clinker-paved gutter, is used, with which they are pushed down the gutter, and through an opening at the extremity of the house, into a deep pit made to receive them; and afterwards, by means of a long spout, water is conveyed from the pump into the gutter, which is washed perfectly clean, twice, or oftener, in the day; as also is the channel in front of the cows. As the cows remain constantlytied up, from the time they return from pasture to their winter quarters, in November or December, according to the season of the year, till they go to grass in April, it is surprizing, from this arrangement and economy, with what facility and thrift a great number of cows are taken care of by a very few hands; and also with what neatness, though they are allowed no litter, but what little refuse hay is left by them. The eye of the master indeed is always upon them, for at the upper end of their house he also has usually his abode, divided only by a running curtain, but fitted up with every convenience, and in the neatest manner, for conducting the dairy, as coppers for boiling water, and the various messes for the cows, &c. In short, no people on earth (the Chinese not excepted) study and practise the "*multum in parvo*" more assiduously, and with greater success, than the patient, industrious, frugal, provident Dutchman, among whom many ingenious contrivances in all arts and professions are to be found, worthy the imitation of the most enlightened nations

nations. When the cows go to grass, they are clothed, (at least those which are tender, or have lately calved) with a coarse hempen *jacket* extending from the shoulders to the rump, and half way down the ribs, and fastened by strings under the legs; the intention of which is to guard those which are tender, &c. after their winter's confinement, from the perpendicular dews, which are very heavy in their low, deep, rich meadows, and likewise to increase their milk, which warmth very essentially contributes to. The same precaution is adopted, I understand, in winter, before they return to house, if the weather is severe, or when a cow calves late. While at grass, their keepers avail themselves of every opportunity to supply them with brewers' wash, &c. which from habit they drink greedily, in preference to such unpalatable (if not brackish) water as their dykes usually afford.

After the cows quit their winter quarters, their house is cleaned with the greatest niceness, and even the boards washed, and scoured with hot water, sand and soap; but notwithstanding all this neatness, and the constant care and attention of their owners, it sometimes happens, as in 1772 and 1773, that they lose the greater part of their stock: the bowels were generally first attacked, and that so violently, as to prove fatal in a few hours. This distemper then prevailed not only in the cow-houses, but pursued the poor animals to their pastures, in one of which half the herd would be swept off in a few days, and all escape perhaps in that adjoining; while in a third neighbouring pasture the distemper raged with equal violence as in the first. No less various was the conduct of the several proprietors on this occasion—some considered the distemper as a judgment from heaven, and thought it in vain, if not impious, to attempt any means for their recovery. Others, less superstitious, adopted

the

the most celebrated remedies, and left no means unessayed to oppose the virulence of the distemper, but with little success. It is remarkable, that the cows in Flanders are generally very healthy, notwithstanding they lie on their dung, more or less, the year round. The Flemish peasant keeps his cattle rather in a cave, than a cow-house, and instead of carrying out the dung, fresh litter, and dry sand, or earth, is added daily to it, so that before this cave, or cow-house, is cleaned out, the cattle stand six feet or more higher than the floor. His milch cows (as well as horses) are housed every night, even in the summer, and are fed with trefoil, or clover, or vetches, &c. and let out to feed in the pastures early in the morning, and brought back to house about ten; have trefoil, &c. till four in the afternoon, and are then turned out till eight; by which means an immense quantity of the richest manure is raised in Flanders during the whole summer, which, by cattle being kept in the fields in that season in all other countries, becomes the food of flies, and the sport of winds. Fatting bullocks alone are permitted to lie abroad day and night in Flanders, otherwise they would not fat in very hot weather. In winter, the Flemings feed their cows with hot messes, &c. nearly as the Dutch do.

Such is the substance of what I have been able to glean from my very imperfect notes, hastily penned down, respecting the economy of the Dutch in the management of their cows. It is very probable, that I may have been mistaken in what I saw, and misinformed in the inquiries I made; I can only answer for the purity of my intentions—a desire to add my mite to the treasure of agricultural information now collecting, and to render the situation in winter, of that most useful animal the (London) cow, more cleanly and comfortable, and to enable her to afford a more ample supply of that necessary and most wholesome article of milk.

Considering the most ruinous consequences which followed lately at Radcliffe, from so trifling a cause as the boiling over of a cauldron of tar, I shall make no apology for troubling you with an easy precaution, long adopted by the Dutch, to obviate a similar misfortune; your patronage and recommendation of which would ensure its adoption in naval yards, to the great advantage and security of the community. Over every tar cauldron is fixed a large wooden hutch, cased (or at least it should be) with thin iron plates; this is filled with fine sand, which, in case the tar happens to take fire in boiling, the man who superintends the operation lets out, by means of a trap (or sliding door), and the fire is instantly subdued by a deluge of sand—the tar, though combined with the sand, still remaining equally serviceable for a variety of inferior uses. This contrivance I observed in the rope-yard at Amsterdam, belonging to the Dutch East India Company. Adjoining to the cauldron, which was fixed in strong brick work, is a long room, divided from the cauldron without by a thick brick wall, in which is fixed a large iron stove (advancing considerably into the room) to heat the tar cauldron, which throws out a great heat in the room below, and up into a chamber above, which instead of a regular floor, has only thick deal spars, three inches apart, nailed down on the beams. Here, and in the room below, a great quantity of cables, and ship tackling of all sorts, is coiled up and dried, before they are tarred. The cables and ropes are not worked up so *tort*, or tight, as with us, in order to render them more elastic, and not so liable to strain or break in heaving the anchor, and the ropes less apt to strain the yards and topmasts in wet, tempestuous weather.

I have the honour to be, Sir, &c. &c.

Wargrave, Dec. 1794. THICKELL.

No. VIII.

The Method of making Butter in Holland. By R. P. CAREW, *Esq.*

HAVING milked the cow, the milk is not put into pans till it is quite cold. It is then stirred two or three times a day with a wooden spoon, to prevent the cream from separating from the milk; and if it can be stirred till the spoon will almost stand in it, it is deemed so much the better. When it is found to be sufficiently thick, it is put into the *churn*, and beat for an hour. When the butter begins to form, a pint or more of cold water, according to the quantity of the milk, is poured in, to separate the butter from the milk.

When the butter is taken out of the churn, it is washed and kneaded till the last water is *perfectly clear* and free from milk. By this method, a greater quantity of butter is made from an equal quantity of milk. The butter is firmer and sweeter. It will keep longer than that which is made in the ordinary mode, which is in use in England; and the butter-milk is thought preferable.

N. B. A churn is thought better adapted to the purpose than a barrel.

No. IX.

On the beneficial Effects of Steaming Grain. By JOHN LIGHT BANGER, *Esq. of Madura.*

EXTRACTS FROM SUNDRY LETTERS.

13*th July*, 1794.—"You will remember Mr. P—'s proposal, that we should each take a given quantity of

the same cargo of grain, and that at the expiration of a certain time, his method of preservation should be found superior to mine. It is now six months since we commenced our experiments, and upon weighing an alquiere (a measure used in the island of Madeira, 2¼ of which make an English bushel), the weight of his was found to be 17lb. 15½oz.; of mine 20lb. 2¼oz. But the essential difference was in the quality, as the grain kept by him was unsaleable, and mine better and sweeter than when I received it."

24th September.—"I was much obliged by your account of the produce of the island of St. Michael's; but I omitted, when you left me, to request that you would inquire into the manner there practised for keeping grain. I am anxious for intelligence upon this subject, from observing that grain from that island cannot be preserved so long a time as what is imported from any other country: of this, I have recently obtained sufficient experience, by having ordered a part of a cargo of grain to be placed in a store which had lately been used with island wheat, and from this cause, in a very short time it is become badly infected with weevil. Mr. V. who purchased a part of the same cargo, is, from a similar cause, a fellow sufferer. I am not, however, anxious respecting it, as the grain I purchased from Mr. P. and steamed once on the first January, and again on the first of June, is now in perfect preservation, and free from weevil. The Indian corn that I purchased from Mr. M. in March last, at which time it was very full of insect, is at present free and perfect without a second heating. I intend, however, passing it again, as soon as I have fixed my copper in stone work, and make no doubt of its keeping through the year. I am examining with great attention, a particular

ticular tendency that the grain lately arrived has to the generation of insect; I imagine it to proceed, in some degree, from the embargo laid upon American vessels having obliged the merchants in the different sea-ports to keep their granaries so full as to have heated the grain; but I have some reason to think, that the months of March and September are attended with peculiar circumstances respecting weevil.

"Since you left me, I have weighed the quantity of coal consumed in a day by the kitchen portable steam apparatus you sent me, and find it one hundred pounds. With this trifling copper I can steam three moys (or seventy-two bushels) in the common hours of work of one day."

9th December.—"My experiments with steam succeed well: I have lately steamed a granary of sixty moys (or 1440 bushels) in about three weeks. I find the waste of grain, not badly infected with weevil, to be one per cent. in weight in one month, and the increase so rapid, that if proper precautions are not taken, in less than six it will be rendered totally unfit for use. In the West Indies, I am satisfied from my own experience, that three months will be equal, in destruction to the grain, to six in this temperate climate. Perhaps no part of the world would experience so much benefit from the use of steam as a rice country: I have several rice experiments at present under my observation, the result of which I shall transmit to you."

27th January, 1795.—"I have the pleasure to inform you, that I have at last succeeded in procuring tubes sufficiently tight, by changing from tin to copper, and although I do not apprehend any dangerous consequences

from this use of copper, yet to prevent any observations being made upon the possible injury to the health, &c. I have ordered the tubes to be tinned. I think copper a better metal than tin for my purpose; but it is probable that you or your friends may be able to point out something preferable to either; for you will remember that economy induced me to begin with tin, though my afterwards adopting copper has, I believe, increased my expense at least fivefold.

"My experiments with rice succeed well; they remain free from dust. I believe I have already mentioned to you, that I apprehend steam may be rendered very serviceable in separating the husk from the grain, as barley, rice, &c. and I do think it may be extended to flax, and many other things.

"It has escaped me to relate to you a circumstance that has lately particularly attracted my attention. Having sown some grain that had been steamed, I found, to my surprise, that it grew: I accordingly repeated my experiment, and it was attended with equal success. The very flourishing state of what is come up, and my own observations, lead me to think that blight in wheat might be materially prevented by steaming it previous to its being sown; for if, as the French farmers imagine, the disorder which they call *la carie* (and which I believe is nearly the same as what in England is termed the *smut*) proceeds from the egg of the insect, or from any thing in the grain before it is deposited in the earth, there is no doubt in my mind that steaming it would be an effectual preventative.

"I have lately taken an alquiere of wheat that had been steamed, and another that had not. On sending them both to the mill, I find an increase of near five per cent. in the bread produced from the wheat that was steamed. I do not at present certainly know if this difference

fermence would have arisen, if the latter had been dried in the sun, or in an oven, as is sometimes practised here: it is a system that is not, I believe, common in England; and even here is attended with considerable trouble. The best bread made here, is a mixture of fine American flour and island wheat; and I have no doubt, that if a baker made use of steam, he might, in the proportion of wheat in the quartern loaf, save from five to ten per cent. When I am a little at leisure, I shall try the advantages to be obtained by steaming seeds to be sent to foreign countries. Biscuit, I am convinced, may be kept any space of time; but from its size, the operation of steaming it is considerably more difficult than grain. In general, I have to observe to you, that the wheat purchased of Mr. P. in January 1794, is better than when I received it. The Indian corn purchased of Mr. M. in March is perfect, and free from weevil; as is also a part of the cargo brought by Capt. Hogg. Sixty moys of the prize wheat is now selling easily at 700 dollars, at the same time that Mr. V. who purchased a part of the cargo, has with difficulty been able to obtain 650 dollars."

28th March.—"The flourishing state of the wheat sown after being steamed, surprizes every person to whom I have shewn it, and I think it an object well worthy attention."

No. X.

The following Observations, on the Yellow Colour which is sometimes observable in the Fat of Mutton and Beef, and the Method of discovering it while the Animal is living, are the Substance of a Conversation which the Author had with a Smithfield Salesman on that Subject.

THE colour of the fat of a sheep may easily be known by making an incision, of about two inches in length, through the skin and fat of the tail of the living animal, and by spreading the wound with the side of the knife at the time of cutting it, which will shew the natural colour of the fat, whether it be fair or yellow.

Lambs and calves should always be tried in this manner, and such as should prove, on trial, to be of an unpromising colour, should not be kept for breeding. If this method was always pursued, the grazier might be able to warrant his stock to die of a fair colour.

Cattle whose fat is yellow, fatten as kindly as those whose fat is of a fair colour, and they are said to be less subject to the rot.

The yellow colour extends through every part of the fat, but it is not, on that account, disliked by the tallow-chandler. The flavour of the meat whose fat is of this colour, cannot be distinguished from that whose fat is of the fairest colour, and yet it is sold for three-halfpence or two-pence per pound less, and is, therefore, mostly put off by candle light.

This defect must be hereditary; as no pasture, or particular food, can either produce or remove it.

Sheep which have been tried in the manner here described,

scribed, and found yellow, have been sent to the Thames marshes, kept there a year, and, when slaughtered, have proved as yellow as gold.

The foregoing observations apply as well to beef as mutton.

No. XI.

On the Shipping of Corn.

SHIPS for corn or merchandize have usually one man to about twenty tons, or twenty men to a ship of 400 tons; this proportion includes the captain, his mates, and the whole crew. Thirty-eight bushels of good wheat weigh a ton, but suppose the average should be forty bushels, or five quarters per ton.

Our annual foreign supply in wheat is nearly half a million quarters, that is, equal to one hundred thousand tons. As merchant ships are usually of between three and four hundred tons burden, this quantity of foreign wheat would load three hundred such vessels. That is, about one twenty-second part of our bread corn; therefore (300 × 22=) 6600 ships of 334 tons each, are capable of sailing with as much bread corn as would supply the whole of Britain for one year.

The excess of the whole of our imports over our exports, in all sorts of grain, is about 1,200,000 quarters, or 240,000 tons. This is equal to the freightage of 720 ships of 334 tons each, to navigate which would require about 12,000 sailors.

The whole consumption of Britain in corn is supposed to be twenty-two and one half times more than the ex-

cess

cess of our imports; therefore, the whole of our grain is (240,000 × 22½ =) 5,400,000 tons, which is sufficient to load (720 × 22½ =) 16,200 ships; and these would require 270,000 sailors.

These calculations suppose the ships to convey only one freight annually; if they could bring two, the foregoing numbers would be reduced to one half of what they are.

It is obvious, that in the present state of the world, such a large quantity of corn could not be obtained, and that neither this number of ships nor of sailors, could be procured and employed in any such service; therefore it is impossible to supply the present population of Britain with corn wholly by commerce.

J. M.

No. XII.

The following Statement is an Accurate Extract of the Price of the Quartern Loaf, Wheaten Bread, at the Commencement and Conclusion of the several Mayoralties, herein stated, from the Year 1735 to November 9th, 1803, as entered at the Town Clerk's Office, Guildhall.—The Price at the Commencement of each Mayoralty shews the Price at the Conclusion of the preceding Mayoralty.

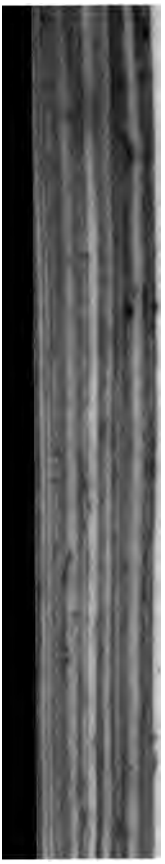
Date. Nov. 9.	Mayoralty.	Price of Q. Loaf.	Date. Nov. 9.	Mayoralty.	Price of Q. Loaf.
1735	Williams	4¼	1770	Crosby	6¼
1736	Thompsom	5¼	1771	Nash	7¼
1737	Barnard	5¼	1772	Townsend	8
1738	Perry	5¼	1773	Bull	7¼
1739	Salter	6	1774	Wilkes	8
1740	Parsons*	7¼	1775	Sawbridge	6¼
1741	Godschall*	5¼	1776	Hallifax	6¼
1742	Willmott	4¼	1777	Esdaile	7¼
1743	Westley†	4¼	1778	Plumbe	6¼
1744	Marshall	4¼	1779	Kennett	5¼
1745	Hoare	4¼	1780	Lewes	7¼
1746	Benn	5¼	1781	Plomer	7
1747	Ladbroke	5	1782	Newnham	8¼
1748	Calvert	6	1783	Peckham	7¼
1749	Pennant*	5¼	1784	Clarke	7¼
1750	Cockayne	5¼	1785	Wright	6¼
1751	Winterbottom*	6	1786	Sainsbury	6
1752	Gascoyne	5¼	1787	Burnell	6¼
1753	Ironside*	6	1788	Gill	6¼
1754	Janssen	5	1789	Pickett	7¼
1755	Bethell	5	1790	Boydell	7¼
1756	Dickenson†	7¼	1791	Hopkins	6¼
1757	Asgill	7¼	1792	Sanderson	7¼
1758	Glynn	6	1793	Le Mesurier	7¼
1759	Chitty	5	1794	Skinner	7¼
1760	Blackiston	5¼	1795	Curtis†	12¼
1761	Fludyer	4¼	1796	Watson	8¼
1762	Beckford	5¼	1797	Anderson	9¼
1763	Bridgen	6	1798	Glyn	8
1764	Stephenson	6¼	1799	Combe	13
1765	Nelson	7	1800	Staines†	17¼
1766	Kite	8	1801	Eamer	10¼
1767	Harley	8¼	1802	Price	10
1768	Turner	6¼	1803	Perring	10
1769	Beckford*	6			

* Died in their Mayoralties.

Parsons, succeeded by Lambert - - - - - - - 1740
Godschall, - - Heathcote, 1741
Pennant, - - - Beachford, 1749
Winterbottom, Alsop, - 1751
Ironside, - - - Rawlinson, 1758
Beckford - - - Trecothick 1769

† Westley, 1743, bread two weeks at 4*d.* per quartern loaf in this Mayoralty. Dickenson, 1756, bread four weeks at 9¼*d.* per quartern loaf in this mayoralty. Curtis, 1795, five weeks at 1*s.* 3*d.* per quartern loaf in this mayoralty, the penny loaf weighing 4 oz. 10 dr. and Staines, 1800, four weeks at 1*s.* 10½*d.*

A peck loaf should weigh 17lb. 6oz. 2dr.—A half peck, 8lb. 11oz. 3 dr.—A quartern, 4 lb. 5 oz. 8 dr,



INDEX.

A

PAGE

ABUSES among the retailers of milk, - - 424
——— which call for a speedy remedy, - - 611
Acre, proofs that an acre can support one inhabitant, - 130
Acres, the number of in Middlesex, - - 2
—— of wheat in Middlesex, - - - 202
—— of barley in ditto, - - - - 232
—— of beans in ditto, - - - - 241
—— of pease in ditto, - - - - 247
—— the number of in South Britain, - - 642
—— ditto, occupied by each species of crop, - 641
—— four to each inhabitant, - - - 128
Acts of Parliament, the unreasonable expense of, - 602
After-grass, how disposed of in Middlesex, - 285 to 288
Agriculture, the number of persons supported by it, - 129
——— cannot be much improved, so long as farmers are compelled to endure the several grievances enumerated, - - - - - 607
——— the annual produce of, - - 572 & 645
——— the sole cause of an increasing population, - 586
Agricultural legislation and police, - - - 610
——— capital of South Britain, - - 572
——— inhabitants, the number of in South Britain, - 573
Albion-mills, some account of them, - - 226
Allotments to houses in lieu of common-rights, - - 49
Animals to be fattened, how they should be kept, - - 436
——— foreign, account of, at Earl's-court, - - 431
Animal food, the quantity of, consumed in London, - 541
——— ditto in Middlesex, and the value of it, - - 648
——— ditto in South Britain, - - - - 648
——— ditto, the quantity consumed by each inhabitant, - 511
——— ditto, the price of, how it is increased, - - 512
Annual produce of land in South Britain, - - 645
——— how it may be doubled, - - 658

Appendix,

PAGE

Appendix, - - - 659
Artificers, rural, the character of in Middlesex, - 60, 62, & 63
——— their want of dexterity, 607
Arbitration between landlord and tenant, 59
Arable land, chapter on, - - - 158
——— the expense of in Middlesex, 97
——— the produce of in ditto, 399
——— the method of laying it down to grass, 105 & 302
——— the quantity and produce of in South Britain, 394 & 641
Ashes, the quantity obtained by paring and burning, 369
——— peat, an account of those at Newbury, - 368 & 666
Average deficiency of corn for eleven years, - 634
——— quantity and price of corn per acre, 635

B.

Bakers, the number of them, and their dependent state, - 228
——— their expenses and profit, - - - 230
Banger, John Light, on steaming grain, Appendix, No. IX. 675
Bakewell's system recommended, 650
Banks, Sir Joseph, on Spanish sheep, 118
Barn floor, observations on, 49
Barley, the cultivation of, section on, 259
——— its produce in beer and spirits, 259
——— the number of acres cropped with it and rye, 611
——— a note on pearl-barley, 238
——— substitute for tea, - - 230
Beef, the yellow colour of, Appendix, No. X. 680
Beans, the cultivation of, 217
——— exported to Africa and the West Indies, 216
Beer, the quantity of agricultural produce annually converted into it in South Britain, 638
——— consumption of in Middlesex, 511
Bees, section on, - - - 494
Berkeley, the Earl of, on acts for enclosure, &c. 609
Blight described, - - 207 & 378
Board of Agriculture, the effects to be produced by it, 653
Bogs, the method of draining and cultivating them, 337
Boor-cole, - - 272
Bray, William, Esq. on tenures, - 40 & 634
Bread, observations on, - - 228, 504, & 508
——— the price of for seventy years, Appendix, No. XII. 683
——— corn, the quantity consumed by each inhabitant, 510 & 637

Brentford,

PAGE

Brentford, the county town, - - - 52
——— road, - - - 529
Brewers, an account of them, - - 581 to 585
Breweries, the quantity of porter, - - 582
——— of table-beer, - - 584
Bricks, value of the earth converted into them, - - 23, 24, & 25
——— the expense of making them, - - 26
Bridges, observations on Blackfriars, Putney, and Kew, - - 586
Bridewell-hospital, revenue and expense of, - - 647
Bucknall, T. S. D. Esq. on hay-making, - - 212
Building, - - - - 43
Bushey-park, - - - 31 & 400
Butter, observations on, - - - 487
——— method of making it in Holland, - - 430
Byng, George, Esq. M. P. his cultivation, - 136

C

Cabbages, a method of preserving them, - - 266
——— the turnip-rooted, - - - 272
Calcareous earth, the great use of, - - 382
Canals, section on, - - - 527 & 652
Canine madness, bad effects of, - - 626
Carew, R. P. Esq. on making butter, Appendix, No. VIII. 675
Carts, observations on, - - 100, 108, & 111
Carriages, ditto, - - - 526
Cattle, neat, section on, - - - 409
——— rules to be observed in breeding them, - 461
——— yard, description of a good one, - - 45
——— fattened with molasses, - - 668
——— the number of sold in Smithfield-market, - 538
——— further observations on, - - 650
Calves, the suckling of, - - - 426
Character of the farmers, - - 59
Charity-schools in Middlesex, - - - 76
Changing seed, the unwise system of, - - 201
Chase, Enfield, section on, - - - 134
——— additional observations on, - 663 & 665
Chalk, observations on, - - - 386
Chicory, noticed, - - - 274
Church and college leases, - - - 87
Churches, an account of building fifty in the year 1710, - 588

Cities,

PAGE

Cities, how injurious to population, - - 564
Civil policy, - - - - - 615
Clapham-road, - - - - - 524
Clay soil, - - - - - 15 & 177
Climate, section on, - - - - 21
Clitherow, James, Esq. on brick earth, &c. - 54
Closes, the size of, - - - 15, & 154 to 157
Clover, red, the cultivation of, - - 238
——— its great importance, - - 250
——— its produce, expense, and profit, - 300
Coal, the quantity imported, - - - 513
—— the quantity brought by the Grand Junction Canal, - 515
—— market, - - - - - 515
—— the expense of, - - - - 515
—— the quantity annually consumed in London, - 14 & 513
—— additional observations on, - - - 516
Cole, or rape, brief observations on, - - 270
Cole, Mr. on the feeding of horses in London, - 469
Colonies, the advantage of foreign, - - 552
Colours for dyeing, - - - 277
Commons, section on, - - - 112
——— increase the misery of the poor, - 117 & 119
——— the drainage of is wholly neglected, - 554
——— are a harbour for gypsies and thieves, - 118 & 545
——— are defective in point of labour, - - 125
——— depastured by a miserable breed of sheep, - 485
——— the quantity in Britain, - - 126 & 608
——— the portion of them which must be cultivated, before supplies can be raised to support the inhabitants of Britain, - - - 636
——— enclosing them would add millions annually to the national wealth, - - 125 & 126
——— additional observations on ditto, - 608
Common-fields, section on, - - - 152
——— are too far from the buildings, - 45
——— are incompatible with good husbandry, - 258
Common arable fields cannot be cleansed, - - 209
——— ——— repress the more valuable plants, 258 & 293
Common rights of houses, - - 48 & 138
Commerce, section on, - - 548 to 558
——— additional observations on, 652, and Appendix, No. XI. 680
Committee on corn and flour in London, - - - 255

Compo-

PAGE
Comparative husbandry, - - - - 638
Conduit, an ancient one at Paddington, - - 33
Consumption and supply of South Britain, section on, - 634
Conclusion, - - - - - 654
Cook, the Rev. James, on paring and burning, - 379
Copses, chapter on, - - - - 342
Copyhold tenure, the hardships of, - - 41
Corn crops too often repeated, the ruinous effects of, - 191
—— market, - - - - 544
—— trade, - - - 558 to 570
—— the shipping of, Appendix, No. XI. - 681
—— the exports and imports of, - - - 564
Cottages, section on, - - - 47 to 51
——— with gardens, their utility, - - 50 & 73
——— their rights of common, - - 48
Cows, general observations on them, - - 408 & 414
—— keepers of, the sort of hay preferred by them, - 288
—— the great use of to cottagers, - - 51
Crops commonly cultivated, section on, - - 200
—— the rotation of, section on, - - - 186
—— not commonly cultivated, - - - 270
—— ought to be secured from trespassers and thieves, - 616
Crockford, Mr. on peat-ashes, - - - 666
Cultivated land, the quantity of, in South Britain, - - 639
Culley, Mr. on sheep-feed and clover, - - 289

D

Dairy, observations on the, - - - 409 & 427
—— account of a Dutch one, Appendix, No. VII. 669
Deficiency of corn annually in South Britain, and a statement of the quantity of waste land which must be cultivated to supply it, 636
Delapidation, trials at law respecting, - - 89 to 93
——— observations on, - - - 651
Dibbling, the advantages and disadvantages of, - 178
Distilleries, their good and bad effects, - 577 to 580
Dogs, section on, - - - 625
Dorsetshire ewes, the only breed for house-lambs, - 453
——— for grass-lambs, - - - 457
——— the produce of, - - 457
Downs, or sheep-pasture, section on, - - - 144
——— how they are ruined, - - - - 56
——— the husbandry of compared with other places, - - 639

PAGE

Downs, the manner of letting them, - - - 650
Draining, section on, - - - 355
Dung, the superior value of that produced from fat cattle, - 379
—— half of it wasted by mismanagement, - 380
—— the value of that of a sheep per annum, - 457
Dunghills, the management of them, - - 328 & 377
Dung-yard, a good one described, - - - 45
Dyeing, colours for, - - - 275

E

East, Mr. on paring and burning, - - 144
——— on blue clay, - - - 391
Edgeware-road, - - - - 518
Eggs of insects in manure, - - - 378
Enclosed commons within the last five years, - - 121
Enclosed land in Middlesex, the produce of, - 399
Enclosing the commons, the great advantage of, 113, 122, 127, & 586
——— the common-fields, ditto, - - 45 & 607
Enclosure, general, the great advantage of, - 407
Enclosures, hints respecting the size of, - - 15
Enfield parish and the Chase, - - 134 & 389
——— Chase, the method of cultivating it, - 136 & 365
Estates, and their management, section on, - 57
——————— additional observations on, - 60
Estates, the proprietors of them advised to occupy a farm in the best manner, as an example to the tenantry, - 43 & 650
Estimate of the agricultural produce of South Britain, - 637
——— of the agricultural property stolen, - 612
Exercise injurious to fattening animals, - - 456
Expense and profit, section on, - - 93
——— of making hay, - - 289 & 293
——— of marling an acre of land, - - 389
——— of feeding artillery horses, - - 95
——— of feeding farmers' horses, - - 96
——— of feeding draught-oxen and horses, 462 to 466, 479, 480, & 482
——— of conveying goods along the Grand Junction Canal, 531
Experimental farm, observations on, - - 44
Exports and imports of corn in the port of London, - 564
——————— from and to Great Britain, - 634
Exportation, the effects of, on the soil, - - 649
Extent of Middlesex, section on, - - 1

Fairs,

F

PAGE
Fairs, section on, - - - 536
Falck, Mr. John, on stocking canals and ponds with fish, - 36
Fallowing, section on, - - - 183
Fallows, the great quantity of agricultural produce annually lost in consequence of them, - - 189 & 639
——— the benefits of, - - - 632
——— the expense of, - - - 223
Farm, experimental, - - - 44
Farmers, large and small, compared, - - 54
——— their character, - - - 58 to 63
——— what will make good ones, - - 61 & 62
——— near London are the best in the kingdom, - 188 to 191
——— are impoverished by exhausting the soil, - 193
——— how they may be enriched, - 188 to 191, & 201, 650
——— suffer much by depredations on their property, 610 to 616
——— share less than one-fourth of the annual produce of the land they cultivate, - - - 646
Farm-houses, offices, and repairs, section on, - 44
Farms, the size of, section on, - - - 52
Farm-yard, a good one described, - - 45
Farriery, society for the improvement of, - - 621
Fat meat is less valuable than lean, - - - 415
Feeding, section on, - - - 321
Fences, section on, - - - - 150
Finchley-common, observations on, - - 113, 115
Fires of London, the quantity of coals consumed by them, - 14
Fish-market, - - - - 543
Flannel waistcoats used on fat sheep, - - 437
Floors in a barn are expensive, and do not answer so well as thrashing mills, - - - - 47
Floods in autumn, valuable for irrigating poor land, - 402
Flour, the quantity obtained from a bushel of wheat, - 228
——— consumed in London, - - - 229
Food, less will fatten a quiet than a restless animal, - 436, 438
Foot-rot, to cure, - - - 448
Folding sheep, under the present system, reprehended, - 438
Fordyce, Dr. his account of London, - - 4
Friction in wheel-carriages, observations on, - 526
Frost, the use of, - - - - 101
Fruit-gardens, section on, - - - 323

PAGE

Fruit-gardens, number of inhabitants supported by them, - 325
Fruit, value of what is consumed in London, 326
Fuel, section on, - - - 513
Fullers'-earth at Paddington, - - - 29

G

Gad-fly, how to prevent its doing mischief, 414
Game and vermin, section on, - - 628 to 632
——— how injurious to farmers, 78 & 630
Gardeners never lime their land, 625
Gardens, fruit, section on, 323
——— kitchen, section on, - - - 328
——— quantity of land in South Britain occupied by them, 575
——— at the Neat-houses, observations on, 590
Gates, - - - - 587
Gin, the bad properties of, - 580 & 637
Gleaning, section on, - 694
Gordon, Dr. on colours for dyeing, - 575
Government, its effects on the people, - - 616
Grain, the beneficial effects of steaming, Appendix, No. IX. 675
Grand Junction Canal, - - 615 & 669
Grass, the portion of its weight lost by drying into hay, 599
Grass-land, chapter on, - - - 279
——— quantity in South Britain, - 575
——— how ruined, - - - 56
——— the second crop, how disposed of, 287
——— on ploughing it up, and restoring it to grass, 195, 302, & 307
Grazing, see feeding and, - - 321 & 409
Granite, for roads, - - 595
Graves of tallow-chandlers, a rich manure, 592
Great towns are on the increase, - 503 & 504
Green food, a list of, calculated to support cattle, 199
Greenhill, Mr. his excellent husbandry, 166
Greasy-heeled horses, to cure, 470
Grubs, to destroy, 111
Gunners are injurious to every class of society, - 64 & 78

H

Hammersmith-road, - - 594
Hampton-court, - 600
Hanworth-park, a brief account of, 591

Harrow

PAGE
Harrows and harrowing, observations on, - 99 & 107
Hawkers of fruit and vegetables, their usefulness, - 337
Hay-making, section on, - - - 309
Hay, clover, the method of curing it, described, - 296
——— the produce and expense of, - - 300
Hay barns, their merit described, - - 316
——— markets, strictures on, - - 546
——— the produce and expense of, - - 289 to 293
Heat and cold, the degrees of in Middlesex, - - 15
Hedge-rows, as nurseries for timber, their usefulness, - 344
——— might be made the principal supply of our ship-timber, 346, 649, & 651
——— the effects of in exposed situations, - - 649
——— see fences and, - - 150 & 159
Heriots, section on, - - - 623
Highgate and Hampstead hills, - - 591
Hills, those in Middlesex described, - - 22
Hogs, section on, - - - 435
——— weight of the quarters of, - - 438
Hoes and hoeing, - - - 110, 171
Hops, the soil most fit for, - - - 275
——— description of a cheap instrument for cleansing, - 111
——— the quantity grown in South Britain, - - 572
Horses, section on, - - - 460
——— breeding of, - - - - 461
——— feeding of, - - 95 to 99, & 462 to 468
——— annual expense of, - - 96 to 99, & 465
——— dray, - - - 468
——— observations on those in London, - - 469
——— greasy heels, to cure, - - 470
——— longevity of, - - 470
——— compared with oxen, for the use of farmers, - - 471
——— number in London, Westminster, and Middlesex, - 469
——— number in South Britain, - - 639
——— the quantity of agricultural produce consumed by them, 466, 639, & 642
Hospitals, observations on, - - - 647
Hounslow-heath, observations on, - - 114 & 658
——— road, - - - 529
House-breaking, how to prevent, - - - 617
Houses of proprietors, section on, - - 42

PAGE

Houses of the farmers, and their repairs, strictures on, - 46
——— their rights of common and allotments, - 48 to 51, & 128
——— number of in Middlesex, - - [illegible]
House-lambs, the management of, - - 46 & 452
Hundreds, the names of those in Middlesex, - - 9
Hunters are injurious to every class of society, 64, 78, 152, & 572
Hunter, Mr. John, account of foreign animals belonging to him, 461
Hutchens, Mr. his excellent husbandry, - - 168
Hyde-park, brief account of, - - - 95
Hydrophobia, how it is encouraged, - - 625

I

Implements, chapter on, - - - 99
Imports of corn into the port of London, - 599 & 639
——— and exports of corn to and from Great Britain, - 634
Improvements, chapter on, - - 539
——— by whom they ought to be made, - 539
——— at Stanwell, by enclosing, - 145
——— at Enfield, by enclosing, - 194
——— are excited by well drawn leases, - 79
——— the means of, chapter on, - 646
Industry, how it is repressed, - - 75 & 77
Inhabitants, the number of in every parish, - 202
——— the number of in London, Westminster, and the whole county, - - - 486
——— number of in South Britain, - - 557
——— number of in South Britain wholly supported by agriculture, - - - 139
——— the quantity of bread, animal food, &c. consumed by each, - - - 637 & 643
Inns, on the road-sides, encourage theft, - 569
Insects destroyed by perfect tillage, - - 173
——— increased or destroyed by the state of manure, 270 & 573
——— further observations on destroying them, - 202
Irrigation, observations on, - 581, 586, & 589
Isle of Dogs, a brief account of, - - 291

J

Jays, a remark on, - - - 659
Justices of the peace being brewers or distillers, reprehended, 49

Kerves,

K

PAGE
Kenyon, Lord, on the common rights of cottagers, - 51
Kirwan, Dr. on paring and burning, on manure, and on the quantity of water absorbed by vegetables, - 367, 380, 399
Kitchen-gardens, section on, - - 328
Knight, Mr. reference to his excellent paper on tithes, - 607

L

Labour, the price of, in agriculture, - - 496
——— the beneficial effects of its price being low, - 505
Labourers, section on, - - 495
——— the aversion of to new implements, - 63
——— their state in the year 1436, - - 503
——— they all drink tea, and eat the best bread, - 503
——— the effect of these, with beer and spirits, - 505
Lambs'-house, the management of described, - 46 & 452
—— grass, ditto, - - 457
Land, the quantity of cropped, with each species of grain, 637
—— in South Britain, the quantity and produce of, - 641
Landlords are injured by many things, - - 64
——— advised to cut down pollard trees, - 345
——— advised to restrain the indiscriminate use of lime, 384
——— and tenants, on law-suits between them, - 59 & 89
Land-steward, his qualifications described, - - 38
——— further observations on, - 86 & 607
Leases, section on, - - - 79
—— further observations on them, 24, 38, 59, 354, 368, 372, & 607
—— of farms, how they should be drawn, - 87
Legislation and police, - - 610 to 618
Legislature, the, should interfere, to protect the land and the timber, 651
Leicestershire husbandry compared with other counties, - 634
Lemon, Mr. on the effects of feeding clover, - 298
Lessees from year to year exhaust their farms, - 59
Ley land, its bad appearance accounted for, - 83 & 192
Lime, its good and bad qualities described, - 383
—— stone, of what it is principally composed, - 387
—— water, its great serviceableness described, - 446
Liming land does not destroy insects, - - 172
Liquorice, observations on, - - 274
Live-stock, chapter on, - - 406 to 408

PAGE

Live-stock, improvements in, during the last century, [illegible]
——— further observations on, [illegible]
Loaf, quartern, the price of for 70 years. See Appendix, No. XII. [illegible]
Loam, cold tenacious, the cultivation of described, 178
——— medium, ditto, 180
London, a brief account of, 4
——— the quantity of vegetables consumed in it, 556
——— the quantity of animal food ditto, [illegible]
Lord of a manor, what injury a perverse one occasions, 113
Lucas, Mr. James, on top-dressings, [illegible]
Lucern, a short observation on, 274

M

Machine, the importance of one to raise water for the purposes of irrigation, described, 404
Maggots, to prevent, 449
Malt liquor, consumption of in Middlesex, 511
——— dust, effects of, as a top-dressing, 667
Malthus, Mr. his excellent observations on the poor-laws, and on population, 75, &c.
Man, Mr. his great exertion, 579
Manufactures, section on, 571
Manufactories, large, contaminate the morals of those who work in them, 504 & 571 to 577
——— contrasted with cottages, 574
——— contrasted with agriculture, 586
——— repress population, 586
Manure, section on, 374
——— a cheap method of raising large quantities, 380
——— great loss occasioned by laying it on shelving ground, 381
——— should be thoroughly rotten before it be laid on any land, 270 & 378
——— the best season for laying it on, described, 286 & 380
——— of sheep, the value of, 437
Markets, section on, 537 to 548
——— causes of the fluctuation of, 515
Marl, in Middlesex, used for making the best bricks, 389 to 391
——— much used as a manure on Enfield-chase, 389
——— clayey, caution as to using it, 391
Marsh, Mr. John, on turning dunghills, 380
Marshall, Mr. on laying arable land to grass, 306

PAGE
Marsh land, observations on, 20, 181.
Materials proper for mending roads, 525.
McLeay, Mr. Alexander, on dray-horses, 406
Meadows, section on, 279
——— watered, the mark of perfection in grass-land, 405
——— watered, the produce of, 398
——— not watered, the produce of, 399
Meadow land adjoining London, its produce, expense, and profit, 289
——— at the distance of eight miles, 292
Mealmen, strictures on, 225
Means of improvement, chapter on, 646
Meteor, observations on, 388
Middlesex, its situation and extent, 1
——— derivation of its name, 2
——— husbandry, the superiority of, 634
——— husbandry, the advantages it possesses, 2 & 48.
Middleton, Sir Hugh's, canal, 528
Milk, the quantity, price, &c. 408 & 419
—— retailers of, their nefarious practices described, 422 to 424
Millington Langford, Esq. on feeding cattle with molasses, Appendix, No. VI. 668
Mills for thrashing recommended, 47 & 109
Mineral strata, 27
Mole-plough, for making drains, described, 362
Money sent out of Britain for corn, 637
Moors between Staines and Longford, observations on, 115
Morality promoted by education, 76, 77
Mutton, the superiority of that bred on the South Downs, 436
——— observations on the yellow colour of, Appendix, No. X. 680
——— the quantity of, 644

N

Name of the county of Middlesex, what derived from, 2
Neat cattle, general observations on, 409 to 414
Neat-houses, management of gardens at the, 330
Newbury peat-ashes, an account of them, 366 & 368.
Night-soil, its great effects as a manure, and the loss occasioned by great part of it being carried into the Thames, 374 & 392
Norfolk, observations on the sheep and agriculture of, 436 & 633
Nursery grounds, section on, 338 & 578

O

Oats, the cultivation of, 299

Obstacles

PAGE
Obstacles to improvement, chapter on, - - 607
Obstacles to wheel-carriages on the roads, - 517
Offal of animals, the great quantity of, - 542
Oxen, small, preferable to large ones, - 412 & 413
—— compared with horses for labour, 412, 413, 471 to 485
Ostlers buy stolen things, - - 612
Osiers, the cultivation of, - - 343

P

Paddington Canal - - - 532
—— the City Conduit at, - - 53
Paring and burning, section on, - - 365
—— additional observations on, 172, 142 to 144, & 665
—— the quantity of ashes obtained by, 369
Parish poor, the expense of, - - 70
Parishes of Middlesex particularized, - - 592
Parks, how disfigured, - - 343
Pastures, section on, - - - 279
—— further observations on, - 307 & 439
Patriotism, how its ends are defeated, - 628
Pawnbrokers, the evil tendency of, - - 74
Peace, the principal cause of increasing wealth, - 652
—— preserves the lives of the people, - 128
Pearl-barley noticed, - - - 258
Pease, the cultivation and produce of, - 247
Peat in Middlesex, - - 20 & 394
— earth, the cultivation of, - - 189
— ashes of Newbury, Berks, - - 368
Pigeons, section on, - - - 494
Pilfering, observations on, - - 624
Plantations, the situation proper for, - 147, 344, 649, & 651
Planets, hints for a theory of, - - 387
Pleasure-grounds, the quantity of ground occupied by them, - 641
Ploughs and ploughing, observations on, 99, 101, 169, 171, & 397
Ploughing, the expense of, - - 97
Pollards, the great waste committed in making them, - 345
Ponds, how they might serve the purposes of irrigation, - 402
Poor, and rates for their relief, section on, - 70
Poor, the manner in which they are increased, - 77 & 627
Poor pasture land, the effects of, - - 435
Population, section on, - - 585 to 606
—— of Middlesex, - - 592

Population,

PAGE

Population, how affected by enclosures, - 127, 128, & 608
——— how affected by peace, - - 128
——— how affected by vaccine inoculation, - 128
——— wholly supported by agriculture, - 129
——— the increase of, friendly to agriculture, - 652
——— of some districts equal to the number of acres, 130
——— additional observations on, - 55, 574, 608, & 608
Porter breweries in London, - 581 to 585, & 627
—— the good properties of, - 581
—— the quantity produced from a quarter of malt, - 237
Potatoes, the cultivation of, - - 250
——— additional observations on, - - 252
Poultry, section on, - - - 489
Prices of labour in Middlesex, - 496 & 499
Privies, the soil of, is a rich manure, - 874 & 592
Produce of land in Middlesex, - - 399
——— the quantity consumed by each inhabitant in South Britain, - - 642
——— the annual agricultural, of South Britain, 572, 645
Proprietors of landed estates advised to occupy a farm, by way of example to the tenantry, - - 43
Profits of farming, section on, - - 93
Provisions, and their prices, section on, - 508
Publicans, their profits, &c. - - 581
Public-houses, section on, - - 627
——— the ruinous effects of, - 74, 78, 499, & 627
Pulteney, Sir William, on a beverage for labourers, - 501
Puttock, Mr. James, on a large breed of hogs, - 487

Q

Quartern loaf, the price of for seventy years, Appendix, No. XII. 683
Quicksets for hedges, - - - 150
Quitting a farm, best season for, - - 40

R

Rabbits, section on, - - - 488
Rain in Middlesex, from what points of the compass the greater falls come, - - - 14
—— the utility of, - - - 160
Ra[illegible] observations on, - - 270
R[illegible] using it, - - [illegible]7
[illegible] 1

PAGE
Red clover, the cultivation and produce of, [illegible]
Receivers of stolen property, observations on, 610 to 618
Red gum on wheat described, [illegible]
——— increased or repressed by the state of manure, [illegible]
Reid, Andrew, Esq. letter from him on enclosing the commons, Appendix, No. II. [illegible]
Religious establishments in London, in 1710, 588
Rent, section on, 63 & 139
——— of land, how repressed, 64 & 98
——— of South Britain, its annual amount, 645
Retailers of vegetables, the exorbitant profits of, [illegible]
——— of milk, strictures on, 422 to 434
Revenue arising from barley, 237
Rich food, its effect on animals, 435 & 436
Ridges, the shape of, [illegible]
Rivers, 29
Roads, section on, 517 to 527
——— materials for making them, 524
——— further observations on, 73 & 659
Robinson, John, Esq. account of his farmery, &c. at Wick-green, 46
Rollers, observations on, 100 & 101
Roofs, of various kinds, compared, 46 & 47
Rotation of crops, section on, 186 to 200
——— for sheep downs recommended, 149
——— the Stratford one, 188
——— the Kensington one, 188 & 189
——— an universal one pointed out, 196 to 198
——— additional observations on, 204, 205, 210, 212, 224, 253, 308, 443, 650
Rot in sheep, to prevent, or cure, 444 & 445
Rural artificers, their character, 62
Rye, the cultivation of, 232

S

Sainfoin recommended for a calcareous soil, 301
Sandy land, the cultivation of, 178
——— the advantages of, 179
Scarcity of wheat occasioned by too much wet, 219
Schools for teaching poor children, recommended, 76
Scuffle for cleansing land, described, 110
Sea-shells stratified in Middlesex, 391
Seed, hints as to the choice of, &c. 173, 201, 262, 294, & 659

Seed,

PAGE

Seed, hints as to the changing of, [illegible] 202
—— on the quantity which should be sown, 173 & 174
Servants, section on, 495
—— their diet, 509
—— those of gentlemen, 612
Sheep, section on, 434
—— the number sold at Smithfield annually, 528
—— the number in South Britain, 634
—— the produce and expense of, 457
—— the diseases of, and remedies for, 444 to 449
—— downs, section on, to 146
—— downs, now impoverished, 146
—— downs being enclosed and cultivated, the beneficial effects of, [illegible]
Shelf in strata, 64 & 267
Ships, the number of, employed in the commerce of corn, Appendix, No. XI. 681
Situation and extent of Middlesex, section on, 1
Size of farms, section on, 52
Slates, objections to covering of them, 46
Slugs destroyed by perfect tillage and fallowing, 632 & 172
Small-beer breweries, an account of, 584
Smithfield market, an account of, 597 & 648
Smut on wheat described, and a remedy for it, 206
Snow, the use of, 166
Soap-makers' waste, 993
Societies, section on, 618
—— for alleviating distress, how they are counteracted, 74, 628, 616 to 618
—— agricultural, should offer premiums for cattle which have the largest proportion of lean meat to the fat, 415
Society of Arts, Manufactures, &c. 619
Soil and surface of Middlesex, section on, 16
—— the poorest, how it may be enriched, 186 to 198
—— the produce of, 572
Soiling cattle, the futility of, 424 to 426
Soot, observations on, 172, 393, & 667
South Down sheep, the merits of, 437
—— sheep, the produce of, 458
—— husbandry compared with Norfolk, 633
Sowing, the time of, 174
Sown grasses, section on, 293

Spanish

PAGE
Spanish sheep, experiments on, by Sir Joseph Banks, Bart. 449
Spirituous liquors, the quantity of agricultural produce annually converted into them, - - - 628
Springs, the method of draining them described, - . . 355
Staine-moor noticed, - - 112 & 115
Stanwell enclosure, section on, - - . 148
——— further particulars, - 366
Steeping seed, observations on, - 172, 173, & 235
Stewards, land, the proper qualifications of one described, 38, 39, & 40
——— their ignorance described, - 86 & 607
Stock, live, chapter on, - - 406
Stolen property, the annual amount of in South Britain, - 614
Strata in several wells, described, - - 34 & 391
Straw, its proportion to corn, - - 220
—— cut, and mixed with roots, its use, - 218
—— the produce of per acre, and value per bushel, 220 & 221
—— markets, observations on, - - 546
—— may be used in roofs, to produce equal temperature, 47
Suckling calves, observations on, - 409 & 426
Supply and consumption of South Britain, section on, 634 to 637
Surface of Middlesex described, - - 21
Sutton, Sir Richard, Bart. M. P. on the management of after-grass, on manure, on grass-lambs, and on draught-oxen, 285, 396, 458, & 483
Sutton-court farm-buildings, the perfection of, - 45
Sweep for getting in hay, the importance of, - 110

T.

Tallow-chandlers' graves, a rich manure, - 392
Tares, the cultivation and importance of, - 246 & 252
Tea, substitutes for it, - - - 238 & 504
Team of horses, the annual expense of, - - 97
Tenants from year to year, the ill effects of, 59 to 62, & 83, 87
Tenures, section on, - - - 40
Thames, the river, is nearly saturated with manure, - 401
Thatch is a temperate covering, - - 46
Thieves, observations on, - 343, 610, 624, & 625
Thrashing-mills, the advantages of, - 47 & 109
Tickell, the Rev. Mr. account of a Dutch dairy, Appendix, No. VII. 669
Tiles, advantages and objections to, - - 46
Tillage, section on, - - - 158

Timber

PAGE

Timber in hedge-rows, - - 344
——— trees, general observations on, - 343 & 651
Tithes, section on, - - - 66
——— commuted on enclosure, - 140, 141
Tithe-owners, the injury which they occasion, - 113
——————— the good which they might do, - 120
Travelling, the expense, and expedition of, - 522
Trench-ploughing recommended for certain purposes, - 397
Turnips, the cultivation, produce, and method of preserving them, 258 & 335
——— the manure for, - - 270
——— the manure of, - - 267
Turnip, the fly, slug, and black caterpillar, - 268
——— the rooted cabbage, - - 279
——— the Swedish, - - - 273

U

Uxbridge-road, - - - 510

V

Vegetables, observations on their prices, - 508
Vegetables, the quantity annually consumed by each individual, 511
Vermin and game, section on, - - 698
Veterinary College, - - - 691
Vice, it is useless to complain of, and why, 517, 518, & 615
——— the attempt to root it out is prevented by public-houses, 94
Victualling-houses, section on, - - 627
Vyse, the Rev. Dr. on enclosure bills, - 609

W

Wages of journeymen mechanics, observations on, 499 & 500
Waggon on two pair of cart-wheels, - - 111
Walks, sheep, - - - 144
Wallace, Mr. John, his account of a piece of cloth from Spanish wool, - - - - 452
Waste land, or commons, chapter on, - 112
——————— further observations on, - 651 & 662
Waste, actions for, - - 89 to 93
Water, section on, - - - 29
——— mineral, in Middlesex, account of, - 36
——— furrows, observations on, - - 175

Water-

PAGE

Water-mills, observations on, - 405 & 610
—— how it may contribute to enrich the land, - 281
—— what proportion of, in the weight of grass, - 399
Watering, section on, - - 398 to 405
Weather, the changes of, in Middlesex, - - 7
Weeding, section on, - - 397
Weeds, the seeds of, - - - 578 & 579
Weights and measures, section on, - - 623
Wells, depth of several in Middlesex, described, - 34 & 35
Westminster, a brief account of, - - 5
Wheat, the cultivation and produce of, - 202
—— the disadvantages of sowing it in autumn, 209, 214, 215
—— the advantage of sowing it in the spring 209, 210, 212, 214, 215, 224
—— transplanted, - - 215
—— the produce, expense, and profit of, - 221
—— the quantity consumed by each person, - 510 & 637
—— the number of acres cropped with it in South Britain, 641
Wheel-carriages, observations on, - 108 to 111, & 526
Willows, the cultivation of, &c. - - 348
Wilkinson, Dr. his valuable communications on manure, paring and burning, and on the cultivation of Enfield-chase, 134, 396, & 663
Winds, what are the most prevalent in Middlesex, - 7
Woods, chapter on, - - - 342
——— additional observations on, - - 651
Wool, the clip of, in South Britain, - - 644
Work-houses, when crowded, the ill effects of, - 71
Worms destroyed by perfect tillage and fallowing, 632 & 172

Y

Yellow mutton and beef, observations on, Appendix, No. X. 690

THE END.

Printed by B. M'Millan,
Bow-Street, Covent-Garden.

LIST OF PUBLICATIONS

OF

THE BOARD OF AGRICULTURE.

[illegible] may be had of the Publishers of the Volumes.

	£.	s.	d.
Report of the Committee of the Board of Agriculture on the Culture and Use of Potatoes, 4to.	0	2	0
Account of Experiments made by the Board of Agriculture on the Composition of various Sorts of Potatoes, 4to.	0	1	0
Letter from the Earl of Winchilsea, on the Advantages of Cottagers renting Land, 4to.	0	1	0
Communications to the Board of Agriculture on Subjects relative to the Husbandry and Internal Improvement of the Country. Vol. I. 4to.	1	1	0
Ditto, Vol. II.	1	1	0
Ditto, Vol. III.	0	18	0
Ditto, Vol. IV.	0	18	0
Ditto, Vol. V. Part I.	0	12	0
Elkington's Mode of Draining, by Johnstone, 8vo.	0	6	0
A General View of the Agriculture of the County of Argyle, by John Smith, D. D. one of the Ministers of Campbelton, 8vo. Second Edition,	0	7	6
——— of Clydesdale, by John Naismith, Second Edition,	0	6	0
——— of East Lothian, from the Papers of the late R. Somerville, Esq.	0	5	0
——— of Fife, by John Thomson, D.D. Minister at Markinch, 8vo.	0	6	0
——— of Hertfordshire, by the Secretary of the Board, 8vo.	0	6	0
——— of Herefordshire, by John Duncumbe, A. M.	0	4	6
——— of Kent, by John Boys, of Betshanger, Farmer, 8vo. Second Edition,	0	6	0
——— of Lancaster, by Mr. John Holt, of Walton, near Liverpool, 8vo.	0	5	0

	£.	s.	d.
A General View of the Agriculture of the County of Lincoln, by the SECRETARY of the BOARD, 8vo.	0	9	0
——— of Middlesex, by JOHN MIDDLETON, Esq. of West Barns Farm, Merton, and of Lambeth, Surrey, Land Surveyor, 8vo. Second Edition,	0	12	0
——— of Mid-Lothian, by GEORGE ROBERTSON, Farmer at Gramton, near Edinburgh, 8vo.	0	6	0
——— of the County of Norfolk, by NATHANIEL KENT, Esq. of Fulham, Middlesex, 8vo.	0	5	0
——— of the County of Norfolk, by the SECRETARY of the BOARD, 8vo.	0	8	0
——— of Northumberland, Cumberland, and Westmorland, by Messrs. BAILEY, CULLEY, and PRINGLE, 8vo.	0	7	6
——— of Nottingham, by ROBERT LOWE, Esq. of Oxton, 8vo.	0	4	0
——— of Perth, by JAMES ROBERTSON, D.D. Minister at Callander, 8vo.	0	6	0
——— of Roxburgh and Selkirk, by the Rev. ROBERT DOUGLAS, D. D. Minister at Galashiels, 8vo.	0	6	0
——— of Salop, by the Rev. JOSEPH PLYMLEY, M. A. Archdeacon of Salop, in the Diocese of Hereford, and Honorary Member of the Board, 8vo.	0	7	6
——— of Somerset, by JOHN BILLINGSLEY, Esq. of Ashwick Grove, near Shepton Mallet, 8vo.	0	6	0
——— of Stafford, by W. PITT, of Pendeford, near Wolverhampton, 8vo.	0	5	6
——— of Suffolk, by the SECRETARY of the BOARD, 8vo. Second Edition,	0	7	0
——— of Yorkshire (the West Riding) by ROBERT BROWN, Farmer at Markle, near Haddington, Scotland, 8vo.	0	6	0
——— of Yorkshire (the North Riding) by JOHN TURF, Land Surveyor, 8vo.	0	7	6

A CATALOGUE

OF

AGRICULTURAL SEEDS, &c.

SOLD BY

THOMAS GIBBS AND CO.

Seedsmen and Nurserymen to the Board of Agriculture,

Corner of Half-Moon-Street, Piccadilly, London:

Who also Sell every Article in the Nursery and Seed Line; and with whom Bailiffs, wanting Places, leave their Address, and particulars of Situations in which they have previously been.

Barley. Isle of Thanet.
——— Norfolk.
——— Naked.
——— Winter.
Beans. Small Essex.
——— Tick.
——— Mazagan.
Broom. Common yellow.
Buck, or French wheat.
Burnet.

Cabbage. Gibbs' true drum-head, for cattle.
——— Thousand-headed.
——— Scotch.
——— American.
——— Large red.
——— Long-sided.
——— White turnip above ground.
——— Purple ditto ditto, or kohl rabi.
——— White turnip under ground.
——— Tall green borecole.
——— Tall purple ditto.
——— Siberian hardy sprouting.
Carrot. Large thick orange, for cattle.
——— Large thick red, ditto.
Canary.
Chicory.
Clover Common red.
——— Perennial, or cow-grass.
——— White Dutch.
——— Yellow, trefoil, non-such, or black grass.

Clover. Malta.
——— Providential.

Flax, or linseed.
Furze.

Grass. Meadow foxtail.
——— Meadow fescue.
——— Sheep's fescue.
——— Hardish fescue.
——— Purple ditto.
——— Float ditto.
——— Crested dogstail.
——— Rough cocksfoot.
——— Tall oat-grass.
——— Yellow ditto.
——— Meadow ditto.
——— Sweet vernal.
——— Great meadow.
——— Common ditto.
——— Marsh ditto.
——— Compressed ditto.
——— Annual ditto.
——— Common ray-grass.
——— Peacey ditto.
——— Improved perennial do.
——— Timothy.
——— Yorkshire.
With many other sorts.

Hemp. Russian.
——— English.
Honeysuckle. French.

Lettuce. Large Cos.
Lentils. Small.
——— Large.

Lucerne.

Mangel wurzel.
Maw-seed.
Medicago, various sorts.
Millet. Red.
——— White.
Mustard. Brown.

Oats. Early Essex.
—— Dutch brew.
—— Tartarian.
—— Poland.
—— Potatoe.
—— Flanders.
—— Caspian.
—— Black.

Parsley. Plain.
Parsnip. Large thick.
Pea. Marlborough grey.
— Large grey rouncival.
— Early white.
— White boiling.
— Pearl.
— Blue Prussian.
— Maple.
Potatoes. Ox-noble.
——— Late champion.
——— Large red.
——— Nicholson seedling.
——— Bomb-shell.

Rib-grass. Lambs-tongue, or Upright plantain.
Rape, or coleseed.
Rye.

Sainfoin.
Saridella.

Tares. Spring.
—— Winter.
—— White.
—— Perennial
Trefoil. Birdsfoot.
——— Common, various sorts.
Turnip. Early stone.
——— White Norfolk.
——— Norfolk bell.
——— Stubble.
——— Green top.

Turnip. Red-top.
——— Large yellow
——— Globe.
——— White tankard.
——— Green ditto.
——— Red-top ditto.
——— Large Dutch.
——— True yellow Swedish, or ruta baga.
——— White Swedish.

Vetch. Kidney.
—— Chickling.
—— Pale-flowered.
—— Everlasting.
—— Great wood.
—— Six-flowered.
—— Tufted.
—— Bush.
—— Hoary.
—— Sainfoin.
—— Red-flowered.
—— Biennial.
—— Bastard.
—— Broad-podded.
—— Rough.
—— Single-flowered.
—— Narbonne.
—— Flat-podded.
—— Hairy ditto.
—— Narrow-leaved.
—— Streaked.
—— White-flowered.
—— White-seeded.
—— Horse-shoe.
—— Milk.
—— Liquorice.

Weld.
Wheat. Red Lammas.
Common white.
——— White hedge.
——— White Siberian.
——— Egyptian.
——— Sicilian.
——— Round African.
——— Zealand.
——— Cape.
——— Dantzick
Woad.
Yarrow.

Printed by B. M'Millan,
Bow-Street, Covent-Garden.

DATE DUE			